Vol. 884 Number 1

OFFICIAL GAZETTE

of the

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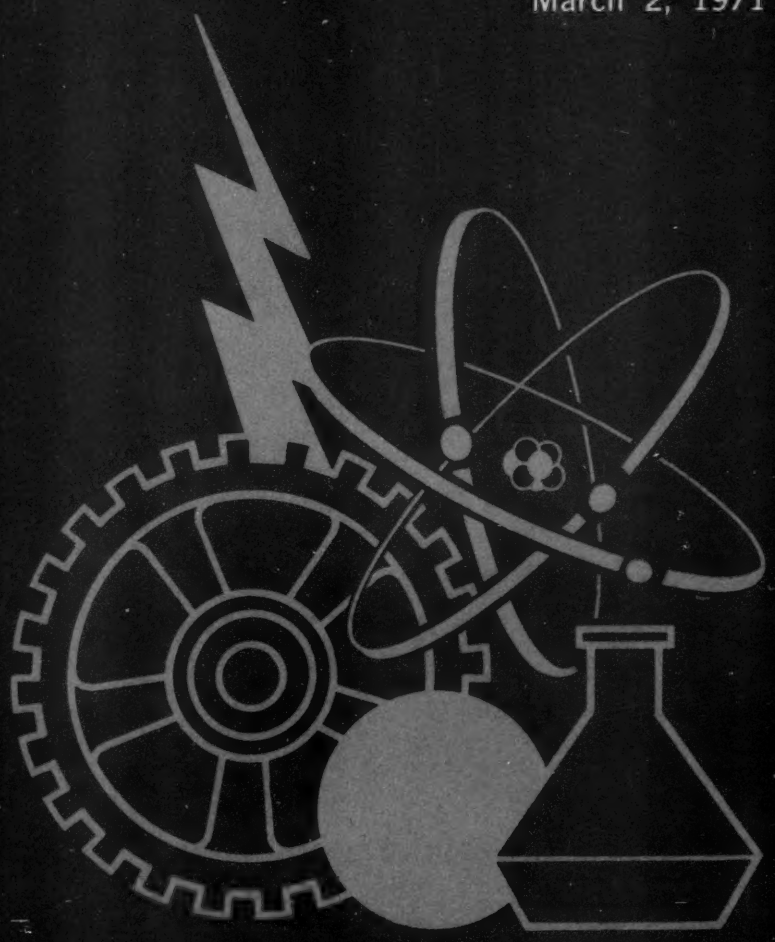
PATENTS

March 2, 1971



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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

March 2, 1971 Volume 884 Number 1

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PATENT OFFICE NOTICES

Certificates of Correction for the Week of Mar. 2, 1971

Re. 26,990	3,515,490	3,535,222	3,540,893
D. 217,381	3,516,817	3,535,231	3,540,951
D. 218,681	3,517,165	3,535,297	3,541,041
D. 218,682	3,517,254	3,535,326	3,541,803
D. 218,683	3,518,239	3,535,332	3,541,635
D. 218,684	3,519,398	3,535,338	3,541,873
D. 219,217	3,519,571	3,535,744	3,542,245
D. 219,382	3,520,663	3,535,935	3,542,373
3,328,763	3,522,179	3,536,121	3,542,459
3,368,698	3,522,451	3,536,499	3,542,516
3,379,587	3,522,589	3,536,605	3,542,538
3,449,153	3,522,733	3,536,642	3,542,744
3,462,484	3,522,916	3,536,663	3,543,307
3,462,504	3,522,944	3,537,353	3,543,572
3,470,219	3,523,192	3,537,880	3,543,592
3,471,476	3,523,738	3,538,018	3,543,618
3,473,613	3,523,766	3,538,029	3,543,756
3,474,463	3,523,805	3,538,046	3,544,111
3,475,407	3,523,998	3,538,085	3,544,118
3,479,403	3,524,421	3,538,110	3,544,122
3,485,513	3,524,528	3,538,142	3,544,214
3,485,810	3,524,876	3,538,299	3,544,250
3,487,068	3,524,903	3,538,640	3,544,289
3,487,888	3,525,077	3,539,154	3,544,311
3,488,154	3,525,101	3,539,305	3,544,317
3,494,911	3,525,995	3,539,512	3,544,319
3,495,445	3,527,139	3,539,516	3,544,392
3,499,317	3,527,272	3,539,532	3,544,465
3,501,505	3,528,657	3,539,569	3,544,609
3,503,095	3,528,701	3,539,606	3,544,729
3,503,697	3,531,543	3,539,653	3,544,998
3,503,748	3,532,276	3,539,748	3,545,458
3,505,099	3,532,635	3,539,847	3,545,641
3,506,686	3,532,654	3,539,897	3,545,757
3,508,706	3,532,708	3,539,960	3,545,763
3,508,873	3,532,855	3,540,070	3,545,970
3,510,248	3,533,273	3,540,256	3,546,136
3,510,522	3,533,924	3,540,277	3,546,142
3,512,609	3,534,038	3,540,398	3,546,225
3,512,920	3,534,608	3,540,501	3,547,546
3,514,146	3,534,878	3,540,809	3,547,717
3,514,985	3,534,916	3,540,831	

Service by Publication

Peter N. G. Murdoch and David Lance Wyman

In accordance with Rule 47(b) of the Rules of Practice of the United States Patent Office in Patent Cases, notice is hereby given of the filing on March 14, 1968, of an application for patent entitled "Pig Figure for Playground Apparatus," on behalf of Peter N. G. Murdoch and David Lance Wyman, whose last known address is 257 E. 72nd St., New York, N.Y. The application was made in compliance with Rule 47(b) and 35 U.S.C. 118 by Creative Parks and Playgrounds Inc. without execution by the said Peter N. G. Murdoch and David Lance Wyman. Notice of the filing directed to the above noted address has been returned undelivered.

Any action to be taken by the said Peter N. G. Murdoch or the said David Lance Wyman in connection with the said application must be taken within thirty days of the publication of this notice.

RICHARD A. WAHL,
Assistant Commissioner of Patents.

Errata

All references to Patent Number 3,560,497 to Max W. Miller, 2-Phenyl-as-Triazine-3,5(2H,4H) Diones, appearing in the OFFICIAL GAZETTE of February 2, 1971 should be deleted as the application was withdrawn from issue and the patent was not issued.

Disclaimer and Dedication

3,444,597.—*Arnold R. Bone,* Needham, Mass. FILAMENT TYPE ATTACHMENT DEVICE AND MANUFACTURE OF SAME. Patent dated May 20, 1969. Disclaimer and dedication filed Oct. 21, 1970, by the assignee, *Dennison Manufacturing Company.*

Hereby disclaims claims 1–8 of said patent and dedicates said patent to the Public.

Disclaimers

2,840,670.—*Winthrop M. Leeds,* Forest Hills, *Benjamin P. Baker,* Monroeville, and *Robert E. Friedrich,* Baldwin Boro, Pa. CIRCUIT INTERRUPTERS. Patent dated June 24, 1958. Disclaimer filed Nov. 9, 1970, by the assignee, *Westinghouse Electric Corporation.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

3,093,864.—*William D. Waldron,* Midland, *Donald L. McIntosh,* Bay City, and *Robert E. Schroeder,* Essexville, Mich. APPARATUS FOR LINING VALVES WITH PLASTIC. Patent dated June 18, 1963. Disclaimer filed Nov. 27, 1970, by the assignee, *The Dow Chemical Company.*

Hereby enters this disclaimer to claims 1, 2 and 3 of said patent.

3,122,483.—*Murray W. Rosenthal,* East Brunswick, N.J. STRONTIUM ION TOOTHPASTE. Patent dated Feb. 25, 1964. Disclaimer filed Nov. 20, 1970, by the assignee, *Block Drug Company, Inc.*

Hereby enters this disclaimer to claims 1 through 5 and 11 of said patent.

3,137,917.—*Joseph F. Dowd,* Orange, Mass. TOOL BITS. Patent dated June 23, 1964. Disclaimer filed Nov. 17, 1970, by the inventor.

Hereby enters this disclaimer to claims 1, 2, 4, and 7 of said patent.

3,176,940.—*Charles M. Echeverria, Jr.,* Milford, Conn. HELICOPTER POD POSITIONING AND SUPPORTING MEANS. Patent dated Apr. 6, 1965. Disclaimer filed Nov. 27, 1970, by the assignee, *United Aircraft Corporation.*

Hereby enters this disclaimer to claims 1 through 3 of said patent.

3,199,658.—*Carl D. Graber,* Orrville, and *Raymond L. Alvarez,* Canton, Ohio. POWER FILING APPLIANCE. Patent dated Aug. 10, 1965. Disclaimer filed Oct. 29, 1970, by the assignee, *Diebold, Incorporated.*

Hereby enters this disclaimer to claim 14 of said patent.

3,364,837.—*Reginald George Schooling,* Yeovil, Somerset, England. PRESSURE CONTROL SYSTEMS. Patent dated Jan. 23, 1968. Disclaimer filed Oct. 20, 1970, by the assignee, *Westland Aircraft Limited.*

Hereby enters this disclaimer to claims 1, 2, 5, 11, 13, 15, 16, 17, 18, 19 and 20 of said patent.

3,390,557.—*Karl H. Erickson* and *Richard L. Bildahl,* Rockford, Ill. DOOR LATCH. Patent dated July 2, 1968. Disclaimer filed Nov. 23, 1970, by the assignee, *Amerock Corporation.*

Hereby enters this disclaimer to claim 10 of said patent.

3,451,112.—*Yale Karmell*, Chicago, and *Kermit K. Geiger*, Carpentersville, Ill. RUBBER COVERED STEEL MILL ROLLERS. Patent dated June 24, 1969. Disclaimer filed Oct. 16, 1970, by the assignee, *Samuel Bingham Company*.

Hereby enters this disclaimer to claims 1 and 2 of said patent.

3,469,334.—*Nick C. Kategian*, Chicago, Ill. DISPLAY DEVICES. Patent dated Sept. 30, 1969. Disclaimer filed Oct. 9, 1970, by the assignee, *Brandell Products Corporation*.

Hereby enters this disclaimer to claims 1 to 16, inclusive, of said patent.

3,471,134.—*Carroll Cone*, Maumee, Ohio. WALKING BEAM FURNACE. Patent dated Oct. 7, 1969. Disclaimer filed Oct. 16, 1970, by the assignee, *Midland-Ross Corporation*.

Hereby enters this disclaimer to claims 13 through 16 of said patent.

3,472,745.—*Laszlo A. Herédy*, Canoga Park, Calif. FUSIBLE ALKALI-METAL SALT ELECTROLYTE. Patent dated Oct. 14, 1969. Disclaimer filed Nov. 2, 1970, by the assignee, *North American Rockwell Corporation*.

Hereby enters this disclaimer to claims 1, 2, 3, 4, 5 and 8 of said patent.

3,472,746.—*Laszlo A. Herédy*, Canoga Park, Calif. ELECTROLYTIC SYSTEM FOR PRODUCTION OF ALKALI METALS. Patent dated Oct. 14, 1969. Disclaimer filed Nov. 2, 1970, by the assignee, *North American Rockwell Corporation*.

Hereby enters this disclaimer to claims 1, 2, 6 and 8 of said patent.

3,505,320.—*Erich Dabritz* and *Heinz Herlinger*, Leverkusen, and *Marianne Bock*, Wuppertal-Elberfeld, Germany. 5-NITROTHIAZOLE DERIVATIVES AND THEIR PRODUCTION. Patent dated Apr. 7, 1970. Disclaimer filed Nov. 2, 1970, by the assignee, *Farbenfabriken Bayer A.G.*

Hereby enters this disclaimer to claims 4, 9 and 10 of said patent.

3,515,709.—*Alfred R. Nelson*, Bay City, and *Vernon D. Floria*, Midland, Mich. PROCESS FOR ELIMINATING POLYMER BUILD-UP ON REACTOR WALLS DURING POLYMERIZATION OF WATER-INSOLUBLE MONOETHYLENICALLY UNSATURATED LIQUID MONOMERS. Patent dated June 2, 1970. Disclaimer filed Oct. 5, 1970, by the assignee, *The Dow Chemical Company*.

Hereby enters this disclaimer to claims 1, 4, 5, 6 and 9 of said patent.

3,519,741.—*Mark Berwyn Knight*, North Caldwell, N.J. REGULATED HIGH VOLTAGE POWER SUPPLY. Patent dated July 7, 1970. Disclaimer filed Oct. 8, 1970, by the assignee, *RCA Corporation*.

Hereby enters this disclaimer to claims 1–6 of said patent.

3,536,209.—*Arthur R. Burch*, Wayzata, and *Charles E. Bates*, Minneapolis, Minn. AUTOMATIC MATERIAL-UNIT STORAGE AND METHOD. Patent dated Oct. 27, 1970. Disclaimer filed Oct. 1, 1970, by the assignee, *Clark Equipment Company*.

Hereby disclaims the terminal portion of the term of said patent subsequent to Mar. 31, 1987.

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
F. H. BRONAUGH, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF FEBRUARY 23, 1971

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-04-69
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	4-08-69
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	10-09-69
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	12-01-69
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	7-07-69
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous.	5-01-70
SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	7-09-69
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	12-01-69
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-24-70
PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments.	11-14-69
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	5-11-70
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages.	12-04-69
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	10-01-69
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	10-13-69
HEAT, POWER AND FLUID ENGINEERING, GROUP 340—C. F. GAREAU, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing.	2-25-70
CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods: Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling.	12-24-69

Expiration of patents: The patents within the range of numbers indicated below **expire during** March 1971, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 181.

Patents..... Numbers 2,670,468 to 2,673,977, inclusive
Plant Patents..... Numbers 1,260 to 1,266, inclusive

REISSUES

MARCH 2, 1971

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

27,078

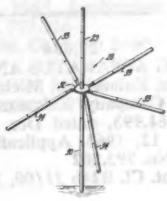
RADIATION SURVEY TRAINING APPARATUS

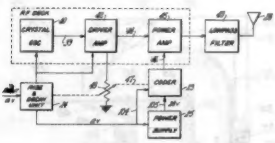
Benjamin Chandler Shaw, Granada Hills, and Howard B. Morrow, Jr., Burbank, Calif., assignors to Cook Engineering Company, Alexandria, Va.

Original No. 3,293,777, dated Dec. 27, 1966, Ser. No. 385,109, July 27, 1964. Application for reissue Dec. 23, 1968, Ser. No. 799,134

Int. Cl. G09b *9/00*

U.S. Cl. 35—1 **21 Claims**





12. Radiation survey training apparatus comprising: a radio transmitter including means to generate a continuous succession of radio frequency oscillations in transmitted radio signals; a rise and decay control unit operable to vary the signal strength of said oscillations in respective stages of rising and decaying signal strength simulating the intensity of nuclear radiation levels during rise and decay of nuclear fallout emission; and selector means for selectively operating said rise and decay unit to enable operation of the apparatus to provide output transmission as well as to confine the operation of the apparatus to simulate either a rise or a decay of fallout emission.

27,079

METHODS AND APPARATUS FOR LOGGING SPONTANEOUS POTENTIALS IN WELLS

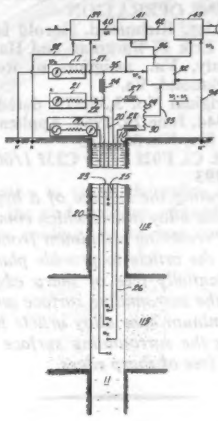
Henri-Georges Doll, Ridgefield, Conn., assignor to Schlumberger Technology Corporation, Houston, Tex.

Original No. 2,728,047, dated Dec. 20, 1955, Ser. No. 293,242, June 13, 1952. Application for reissue Oct. 31, 1957, Ser. No. 694,700

Int. Cl. G01v *3/18*

U.S. Cl. 324—1 **34 Claims**

1. In a method of determining a spontaneous potential characteristic of a formation traversed by a bore hole, the steps of measuring the spontaneous potential at a point in the bore hole, determining the rate of change of the slope of the spontaneous potential curve for the bore hole at the said point, supplying values representing the spontaneous potential and the rate of change of the slope of the spontaneous potential curve as quantities in an equation representing the desired spontaneous potential characteristic of the formation, and indicating the solution of this equation as a function of the location of the point in the bore hole.



27,080

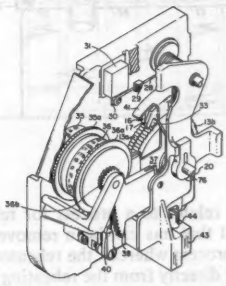
INCREMENTAL DRIVE MECHANISM

Igor Fisnar, Bayside, and Russell H. Lester, Jr., Commack, N.Y., assignors to Fairchild Camera and Instrument Corporation

Original No. 3,456,516, dated July 22, 1969, Ser. No. 668,273, Aug. 14, 1967. Application for reissue Dec. 10, 1969, Ser. No. 883,847

Int. Cl. F16h *27/02*

U.S. Cl. 74—143 **9 Claims**



A continuously rotating input shaft drives a single-revolution mechanism which, in turn, oscillates a pair of pawl carriers each carrying a pair of pawls engaging a

common ratchet wheel which drives the output shaft. Individually interposed between the pawls and the ratchet wheel is a pair of individually angularly adjustable arcuate masks which limit the engagements between their respective pawls and the ratchet wheel. A shroud encloses the pawls and is movable selectively to disable either of them in order to select either of two preset incremental movements of the output drive shaft for each oscillation of the pawl carriers.

27,081

FORMATION OF LOW FRICTION GLASS-LIKE SURFACE ON ALUMINUM SILICON ALLOY FOR ENGINE OPERATION

Gilbert R. Shockley, Richmond, Harold H. Macklin, Jr., Bon Air, and Erik F. Barkman and Harold J. Coates, Henrico County, Va., assignors to Reynolds Metals Company, Richmond, Va.

No Drawing. Original No. 3,33,579, dated Aug. 1, 1967, Ser. No. 378,944, June 29, 1964. Application for reissue July 28, 1969, Ser. No. 860,443

Int. Cl. F02f *5/00;* **C23f** *1/00*

U.S. Cl. 123—193 **10 Claims**

Method of treating the surface of a hypereutectic silicon aluminum base alloy article which comprises the steps of preferentially removing aluminum from and polishing surface layer of the article to provide plateaus of silicon which are substantially free of sharp edges where they protrude above the surrounding surface and the resultant high silicon aluminum base alloy article having plateaus of silicon above the surrounding surface thereof which are substantially free of sharp edges.

27,082

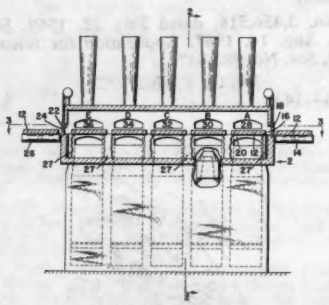
METHOD OF REHEATING A PARTIALLY COOLED CONTINUOUSLY CAST SLAB

Frank A. Alexander, Jr., West Boylston, Mass., assignor to Morgan Construction Company, Worcester, Mass.

Original No. 3,451,664, dated June 24, 1969, Ser. No. 669,480, Sept. 21, 1967. Application for reissue Sept. 2, 1969, Ser. No. 856,863

Int. Cl. F27b *9/14*

U.S. Cl. 263—52 **2 Claims**



The invention relates to a process for reheating a slab *or billet* of metal that has just been removed from a continuous casting process whereby the reheated slab *or billet* may then be sent directly from the reheating furnace to the rolling mill. The reheating process of the present invention is applied to a slab *or billet* in which the interior thereof is hotter than the exterior. Because of the inverted temperatures, the character of the heating must differ substantially from the conventional type of reheating applied to a cold slab *or billet.*

27,083

SINTERED TRANSPARENT BODIES OF ALUMINIUM OXIDE AND METHOD OF PREPARING THE SAME

Emil A. Klingler, Plochingen, Walther Dawihl, Illingen, and Erhard Dorre, Plochingen, Germany, assignors to Feldmuhle A.G., Dusseldorf, Germany

Original No. 3,311,482, dated Mar. 28, 1967, Ser. No. 522,849, Jan. 25, 1966, which is a continuation-in-part of Ser. No. 240,735, Nov. 28, 1962. Application for reissue Mar. 12, 1969, Ser. No. 806,746

Claims priority, application Germany, Dec. 1, 1961, F 35,450, Patent 1,261,436

Int. Cl. C04b *35/10*

U.S. Cl. 106—65 **18 Claims**

A dense polycrystalline body of aluminum oxide having an average grain size of less than ten microns, at least 80 percent of the grains being smaller than 7 microns, yet having high light transmissivity is obtained from aluminum oxide particles ground to a size of about 3 microns or less until their X-ray diffraction spectrum is practically free of Kα doublets by sintering the particles at 1700° to 1950° C. in a vacuum for a few minutes only.

27,084

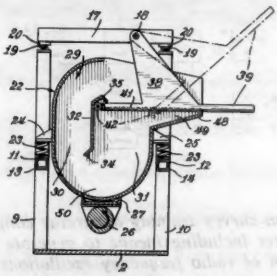
FINISHING APPARATUS AND METHOD

Gunther W. Balz, Kalamazoo, Mich., assignor to Roto-Finish Company, Kalamazoo, Mich.

Original No. 3,161,993, dated Dec. 22, 1964, Ser. No. 323,004, Nov. 12, 1963. Application for reissue Oct. 13, 1968, Ser. No. 793,202

Int. Cl. B24b *31/00, 1/00*

U.S. Cl. 51—163 **41 Claims**



Finishing machines and process whereby finishing medium and parts or work pieces are transported vertically during the finishing process, finishing medium automatically separated from finished parts in an elevated separation zone, finished parts automatically discharged upon completion of desired finishing, and finishing material returned to finishing zone by means of gravity.

27,085

SHOULDERED WASHER AND FASTENING ELEMENT

Harry C. Weidner, Jr., Shaker Heights, Ohio, assignor to Atlas Bolt and Screw Company, Cleveland, Ohio

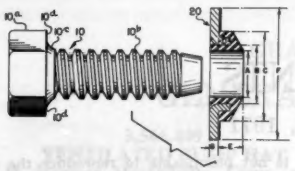
Original No. 3,286,577, dated Nov. 22, 1966, Ser. No. 367,079, May 13, 1964. Application for reissue Nov. 21, 1968, Ser. No. 785,823

Int. Cl. F16b *35/00, 43/00*

U.S. Cl. 85—1 **14 Claims**

An assembly of a washer and fastening element, or a washer for use with a fastening element, having a shank with an enlarged head at one end thereof, wherein the washer comprises a backing member adapted to bear against the enlarged head and a rubber-like sealing ring secured to the opposite surface of the backing member. The backing member and the sealing ring are both provided with centrally disposed holes for receiving the shank

of the fastening element. The backing member further includes axially directed portions contiguous to the sealing



ring for determining the driven position of the fastening element and the washer.

27,086

SUPPORT FOR DRAPERIES AND THE LIKE

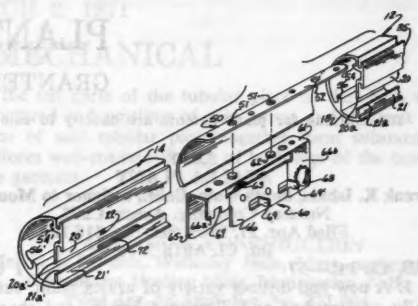
Joseph V. Graber, Waunakee, and Ferdinand F. Salzmann, Madison, Wis., assignors to Consolidated Foods Corporation, Chicago, Ill.

Original No. 3,342,247, dated Sept. 19, 1967, Ser. No. 474,397, July 23, 1965. Application for reissue Sept. 16, 1968, Ser. No. 777,926

Int. Cl. A47h *5/00*

U.S. Cl. 160—345 **7 Claims**

A hollow drapery rod having a slot for drapery carriers is formed in separate rod sections abutted end-to-end and an internal splice extends into the hollow rod sections to join the same. Splice locating means are provided on the inside of the rod sections at the longitudinal



edges of the splice to retain the splice spaced from the slot and hold the rod sections aligned. Traverse cord guide means for guiding the traverse cord are connected to the splice.

PLANT PATENTS

GRANTED MARCH 2, 1971

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,030
AZALEA PLANT

Frank K. Ishida, South Gate, Calif., assignor to Monrovia Nursery Company, Azusa, Calif.

Filed Apr. 21, 1969, Ser. No. 818,160
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—57 1 Claim

1. A new and distinct variety of azalea plant, substantially as described and illustrated herein, and characterized by the large size and unique, brilliant color of its flowers, dense branching, and dark green foliage.

3,031
AZALEA PLANT

Frank K. Ishida, South Gate, Calif., assignor to Monrovia Nursery Company, Azusa, Calif.

Filed Apr. 21, 1969, Ser. No. 818,159
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—57 1 Claim

1. A new and distinct variety of azalea plant, substantially as described and illustrated herein, and characterized particularly by the large size and unique coloring of its flowers, vigorous growth, and dense, dark green foliage.

3,032
POA PRATENSIS

Eugene W. Mayer, Marysville, Ohio, and Torao T. Fuchigami, Long Beach, Calif., assignors to The O. M. Scott and Sons Company, Marysville, Ohio

Filed Aug. 2, 1968, Ser. No. 749,888
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—88 1 Claim

A variety of *Poa pratensis* which is capable of producing turfs of superior quality. The variety exhibits good color, high density, and superior vigor and rhizome formation and is unusually resistant to the debilitating effects of high temperature and to turf diseases such as *Fusarium roseum,* Helminthosporium spp, and *Ustilago striiformis.*

3,033
ROSE PLANT

Seizo Suzuki, 324, 3-chome, Tamayawa-Okusawa-cho, Setagaya-ku, Tokyo, Japan

Filed Oct. 16, 1968, Ser. No. 768,199
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—6 1 Claim

1. A new and distinct variety of rose plant of the climbing class substantially as herein shown and described primarily characterized by: the most early-blooming, large flowers in unique color which are produced recurrently and the petals of which fall clear after full blooming, without retaining dirty remnants.

3,034
PHILODENDRON PLANT

Robert H. McColley, Orlando, Fla., assignor to Yoder Bros. Inc., Barberton, Ohio

Filed Mar. 10, 1969, Ser. No. 805,911
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—88 1 Claim

1. A new and distinct variety of philodendron plant substantially as herein disclosed, characterized as to novelty by its compact growth with better plant volume, improved petiole and stem coloration, high tolerance to unfavorable home conditions, excellent resistance to "shotgun fungus" and bacterial soft rot.

3,035
APPLE TREE

Corliss R. Maxam, 308 Beverly Road, Barrington, Ill. 60010

Filed Mar. 29, 1968, Ser. No. 717,478
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—35 1 Claim

1. A new and distinct variety of apple tree, substantially as herein shown and described, characterized particularly as to novelty by fruit of uniform size and uniform deep red color with no markings, the fruit having a dark red stem, dark green leaves each having a light green underside, red petiole and red main and secondary veins, heavy productivity, uniform coloring habit of fruit throughout the tree with simultaneous maturation throughout the tree.

3,036
GARDENIA PLANT

Frank L. Hiers, P.O. Box 688, Macclenny, Fla. 32063

Filed Oct. 3, 1968, Ser. No. 764,972
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—54 1 Claim

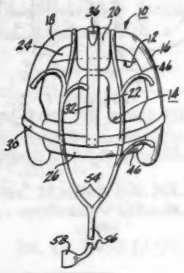
1. The new and distinct variety of gardenia herein shown and described, identified by the combination of characteristics set forth hereinabove.

PATENTS

GRANTED MARCH 2, 1971

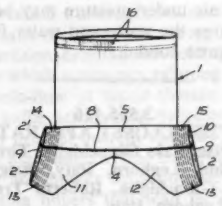
GENERAL AND MECHANICAL

3,566,409
VENTILATED BUMP HAT
James H. Hopper, Hazardville, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.
Filed Nov. 8, 1966, Ser. No. 592,939
Int. Cl. A42b *3/00*
U.S. Cl. 2—3 **5 Claims**



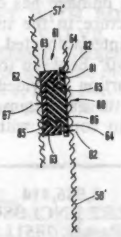
A protective headgear device to be worn over extended periods of time by persons, particularly occupants of moving vehicles, subject to head injuries caused by bumping against surrounding objects, compartment walls, etc., wherein the device is provided with forced air ventilation to decrease discomfort resulting from constant wear of the headgear.

3,566,410
TROUSERLIKE GARMENT
Martin Merk and Karl Hügle, Radolfzell, Bodensee, Germany, assignors to Trikotfabriken J. Schiesser A.G., Radolfzell, Bodensee, Germany
Filed Oct. 11, 1965, Ser. No. 494,597
Claims priority, application Germany, Oct. 14, 1964, T 27,191
Int. Cl. A41b *9/02, 9/04*
U.S. Cl. 2—224 **1 Claim**



The trouserlike garment comprising a tubular piece with two legs, each leg having a welt on its end. The garment has a gusset the ends of which extend into the ends of the legs and have there the same welt-structure as the welts of the legs. The garment is formed by providing a tubular piece ot fabric which is cut open along two diametrically opposing lines each beginning at said welt and leading parallelly to wales unto a point forming the crotch. A strip-shaped gusset formed by a single fabric piece and having longitudinal parallel sides and end portions of welt-structure is provided. The longitudinal sides of the gusset are sewed together with the edges of the cut parts of the tubular piece so that both welt-structured end portions of said gusset and the welt portions of said tubular piece together form substantially uniform welt-structured ends of both legs of the trouser-like garment.

3,566,411
PANTY HOSE CONSTRUCTION
Melvin J. Gordon, Wellesley Hills, Mass., assignor to Manchester Hosiery Mills, Manchester, N.H.
Filed Apr. 16, 1968, Ser. No. 721,804
Int. Cl. A41b *11/00*
U.S. Cl. 2—240 **4 Claims**



A panty hose construction having a separable torso or panty portion and leg portions in which the leg or hose portions are removably secured at the upper periphery to the periphery of the leg openings by fastening means. In one embodiment the fastening means for each hose portion comprises an elastic band that is secured continuously about the leg opening of the panty portion with a series of uniformly spaced fastener halves projecting from the band. Complementary fastener halves are secured to another elastic band at the same uniformly spaced distances with the other elastic band in turn secured to the upper periphery of the hose portion. In another embodiment the fastener consists of a series of rings stitched in spaced relation to the upper periphery of the hose portion at uniform distances with a series of complementary positioned hooks secured to the leg opening of the panty portion. In a third embodiment, an open mesh border extends continuously about and downwardly from the leg openings of the panty portion which mesh is adapted to engage hooks in turn secured to the upper periphery of the hose portions. A fourth fastening means comprises a longitudinally elastic stretchable extruded fastener having complementary extruded female and male portions with the female portion secured to the panty portion about a leg opening and the male portion secured to the inner upper periphery of the hose portion and adapted to be interlocked by pressured inter-engagement with the female portion.

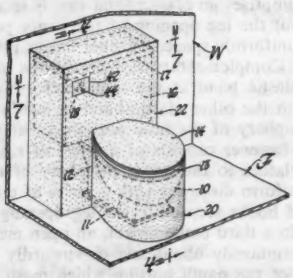
3,566,412
FLAME-RESISTANT FABRIC COMPOSITION
William John Myles, Summit, N.J., assignor to Celanese Corporation, New York, N.Y.
No Drawing. Filed Aug. 27, 1968, Ser. No. 755,737
Int. Cl. A41d *27/00*
U.S. Cl. 2—243 **7 Claims**

The flammability of sewn textile structures is reduced by using meltable sewing thread in all manufacturing operations requiring a sewing process step.

3,566,413
MIDDLE EAR PROSTHESIS
Jean F. E. Marquet, 239 Lange Leemstraat, Antwerp, Belgium
Filed Apr. 11, 1969, Ser. No. 815,392
Claims priority, application Belgium, Apr. 12, 1968, 713,666
Int. Cl. A61f *1/24*
U.S. Cl. 3—1 **5 Claims**

A middle ear prosthesis to restore hearing by mechanically connecting the hammer to the stirrup-bone plate or the internal ear when damage has occurred to the interconnecting bone structure in the middle ear. The prosthesis has two arms interconnected to form an angle of slightly greater than 90° between their axes with an arm having a free end portion provided with a self tapping screw for attachment to the hammer while the free end of the other arm is in contact with the stirrup plate or internal ear.

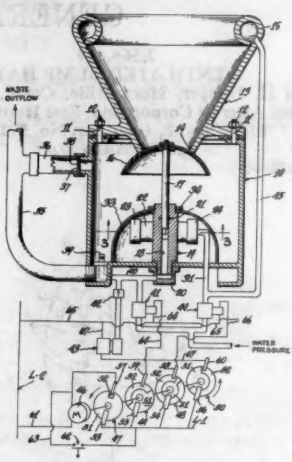
3,566,414
TOILET ENCLOSURE
Margarete Basner, 18511 Margareta, Detroit, Mich. 48219
Filed Feb. 24, 1969, Ser. No. 801,296
Int. Cl. A41k *17/00;* **B65b** *11/00;* **B65d** *65/02;* **B65h** *81/00*
U.S. Cl. 4—1 **1 Claim**

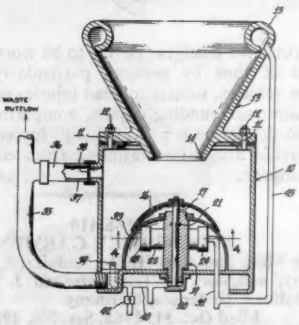


An enclosure for water closets of the type including a floor mounted bowl and a water tank disposed rearwardly of the bowl comprising a free-standing semielliptical frame enclosing the bowl and a free-standing generally rectangular frame enclosing the tank, the frames combining to produce a unitary appearance. A decorative material covers the frames.

3,566,415
PRESSURE DISCHARGE WASTE DISPOSAL APPARATUS
Duane Culp, P.O. Box 345, North Lima, Ohio 44452
Filed Aug. 20, 1969, Ser. No. 851,581
Int. Cl. E03d *1/36, 1/30, 3/10*
U.S. Cl. 4—10 **12 Claims**

A pressure discharge waste disposal device, such as a toilet, for use where waste must be discharged upwardly against the force of gravity or against a head of pressure resulting for any other reason. Said device comprises a chamber for receiving waste, a valve in the chamber shiftable to one position to permit gravitation of waste and



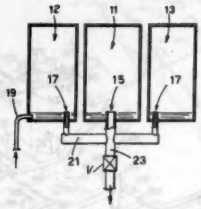


flow of water into the chamber, and shiftable to another position so that air under pressure may be introduced to forceably discharge the waste and water from the chamber through a waste conduit.

3,566,416
WATER CLOSET APPARATUS
Pietro Altieri, Pisa, Ezio Giunchiglia, Tirrenia, Pisa, and Roberto Trebbi, Leghorn, Italy, assignors to Pietro Altieri, Ezio Giunchiglia, Roberto Trebbi, and Giuseppi Conti, Leghorn, Italy
Filed Sept. 5, 1968, Ser. No. 757,539
Claims priority, application Italy, Sept. 9, 1967, 4,728/67; June 12, 1968, 4,093/68
Int. Cl. E03d *7/22*
U.S. Cl. 4—40 **16 Claims**

A tank for water closet apparatus has first and second closed chambers communicating via an opening which is smaller in size than a drain aperture from the first chamber, the second chamber being connected to a supply circuit such that when the drain aperture is closed the chambers are filled with water and a compressed air cushion is formed in each chamber whereas when the drain aperture is opened water is discharged therethrough

rapidly and intensely in a first drain stage whereafter the water from the second chamber is more slowly and gradually discharged during a second drain stage.



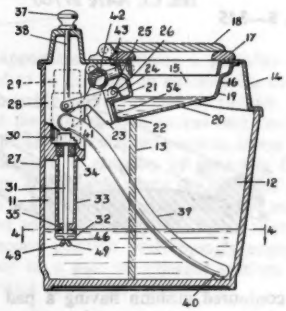
The chambers are preferably formed by two molded sections connected together with a gasket interposed therebetween.

3,566,417

COMBINATION TOILET AND HOLDING TANK

William K. Gross, Agincourt, Ontario, Canada, assignor to Canadian Gisholt Plastics Limited, Toronto, Ontario, Canada

Filed Nov. 21, 1968, Ser. No. 777,629
Claims priority, application Canada, Nov. 25, 1967, 6,089
Int. Cl. E03d 11/10
U.S. Cl. 4—77 7 Claims



A toilet for house trailers, boats, cottages and the like has a holding tank for container sewage of organic origin, a perforate partition dividing the holding tank into a primary chamber which contains a spinning macerator which produces a cyclo-flow of liquid therein and a secondary chamber; the baffle acting as a deflector to maintain the cyclo-flow and prevent current into the secondary chamber. The rotating plate of the macerator which creates the cyclo-flow and breaks up solids has a pair of downwardly projecting fingers that lean backward relative to the direction of spin of the rotating plate.

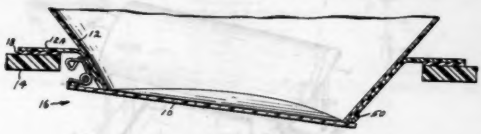
3,566,418

SEPARATOR FLAP ASSEMBLY

Kenneth B. Carlson, Granada Hills, and Norbert J. Palmer, Playa del Rey, Calif., assignors to Monogram Industries, Inc., Venice, Calif.

Filed May 27, 1968, Ser. No. 732,432
Int. Cl. E03d 11/10
U.S. Cl. 4—84 8 Claims

A toilet assembly involves a flushing bowl and a separator flap pivotally mounted and spring-urged near the lower end of such bowl to normally block the view into a lower, bottom tank. The flap is displaceable by flushing liquid to an open position during normal flushing operations and the spring then returns the flap automatically



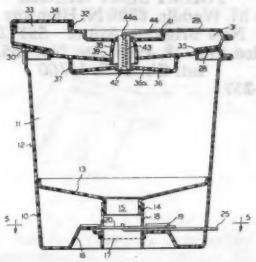
to closed position. For cleaning and other purposes the flap may be moved to an extreme open position, wherein it is automatically maintained in a latched condition by a specially constructed spring which, in addition, performs the other functions mentioned above.

3,566,419

PORTABLE TOILET WITH BOTTOM DISCHARGE VALVE

George J. Danko, Glenmar Park, Md.
(Rte. 1, Box 276–A, White Stone, Va. 22578)

Filed Apr. 2, 1969, Ser. No. 830,167
Int. Cl. A47k 11/02
U.S. Cl. 4—128 5 Claims



A portable toilet which has a bottom discharge valve in the form of a flexible tube which is closed by a linkage actuated pair of opposed plates, and which has a hollow cover adapted to contain a charge of cleaning and rinsing liquid and valve means to control the discharge of the cleaning and rinsing liquid into the bowl of the toilet and to break the vacuum in the bowl.

3,566,420

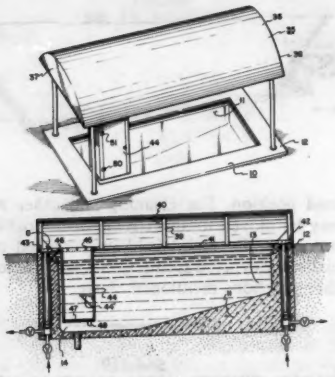
SWIMMING POOL COVER AND SUBMERGIBLE DRESSING ROOM COMBINATION

Ro Mell Peterson and Le Roy S. Peterson, both of 875 S. Redwood Road, Salt Lake City, Utah 84104

Filed Aug. 26, 1968, Ser. No. 755,044
Int. Cl. E04h 3/18
U.S. Cl. 4—172.11 3 Claims

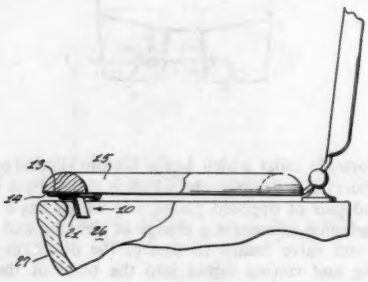
The present invention presents an elevatable, preferably rigid, swimming pool cover and, preferably in combination therewith, a submergible dressing room structure. The cover is designed to offer shade to the pool area as well as provide substantial protection against accidents when the pool is not in use. The dressing room structure provided and cooperatively mounted to the cover structure affords a convenient change enclosure at the pool

area and, additionally, permits the dressing room structure to be submerged in the pool when the pool is not in



use. This avoids the necessity of permanent structures erected separate from the pool.

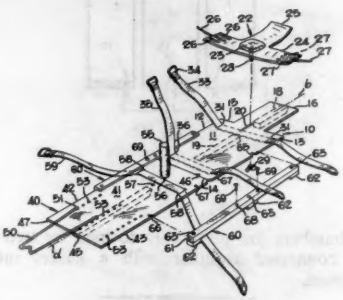
3,566,421
TOILET SEAT GUARD
Olive M. Waddle, 8800 N. Highway Drive, New Brighton, Minn. 55112
Filed Aug. 28, 1968, Ser. No. 755,867
Int. Cl. A47k *13/00*
U.S. Cl. 4—237 **1 Claim**



A deflector secured to the underside of a forward portion of a toilet seat so to deflect urine into a toilet bowl and not allow the same to seep through the opening between the seat and the vitreous toilet bowl and run down the front thereof thus ruining a floor covering.

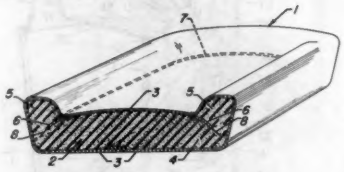
3,566,422
SPINE BOARD APPARATUS FOR RESCUE OF FRACTURE PATIENTS AND THE LIKE
Allen P. Klippel, 7112 Wydown Blvd., Clayton, Mo. 63105
Filed Jan. 23, 1969, Ser. No. 793,514
Int. Cl. A61g *7/10*
U.S. Cl. 5—82 **5 Claims**

Spine board apparatus to be carried, dismantled, in emergency vehicles, for use in rescuing and tarnsporting fracture patients. A short upper board member is first secured behind the patient's back and neck. The patient's lower body is then secured to a short lower board member. Each of these board members has a centerline keel serving as a balancing support. When the two board members are aligned, resting on their keels and tilted down-



ward to ward one side edge, a grooved rail is applied over the other side edges, to connect them. The assembly is then tilted to raise the lowered edges, and a second rail is applied to connect them.

3,566,423
CONTOURED CUSHION
Edward J. Reinfeldt, Brookfield, Wis., assignor to Universal Oil Products Company, Des Plaines, Ill.
Filed Sept. 5, 1968, Ser. No. 757,669
Int. Cl. A47c *27/00*
U.S. Cl. 5—345 **1 Claim**

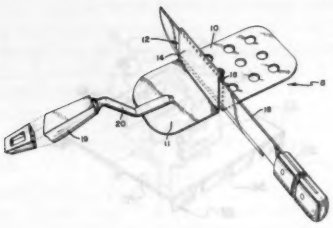


In a contoured cushion having a pad and a separate skin, the improvement, comprising strips of material sewn to the underside of said skin and fastened between a central portion and edge portions of said pad, whereby the skin is pulled taut over the central portiton of said pad and is contoured to the intersection of the outer surface of the central portion of the pad with the outer surfaces of the edge portions of the pad.

3,566,424
COMBINATION SPATULA
Henry Burbig, 1519 Metropolitan Ave., New York, N.Y. 10462
Filed Jan. 13, 1969, Ser. No. 790,651
Int. Cl. A47j *43/28*; B25f *1/00*; B27g *17/04*
U.S. Cl. 7—1 **3 Claims**

A combined spatula or pancake turner, and holddown device with a channel for guiding a cutting knife. The spatula has a blade formed from a single piece of flat spring sheet metal with front and rear sections lying on about the same plane and is formed with an inverted U-shaped channel between the sections which extends upwardly from said plane. The channel forms a slideway to receive a knife for cutting flat articles of food which are firmly held against a support while being cut with the knife. The upper end of the channel also forms a

bending area to permit the second section to be bent upwardly while the first section is held flat against a pan



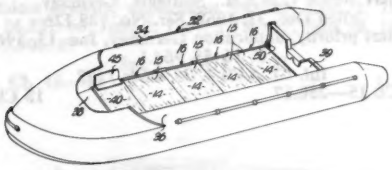
to remove articles from the pan lying near the edge thereof.

3,566,425

FLOORBOARD APPARATUS FOR INFLATABLE BOATS OR THE LIKE

Charles R. Welty, Overland Park, Kans., assignor to Bonair Boats, Inc., Merriam, Kans.

Filed Sept. 10, 1969, Ser. No. 856,776
Int. Cl. B63b *7/08*
U.S. Cl. 9—2 9 Claims



Floorboard apparatus comprising a plurality of floor sections adapted to be disposed in successively contiguous relationship releasably interconnected by slidable coupling means. Each of the essentially identical sections includes means thereon presenting enlarged portions along two side edges of each section. A plurality of generally C-shaped tubular members are slidable along the enlarged portions and move from a first position upon a section permitting adjacent sections to be moved to and from aligned relationship to a second position overlappingly engaging the enlarged portions of a pair of adjacent sections thereby locking the sections in aligned relationship.

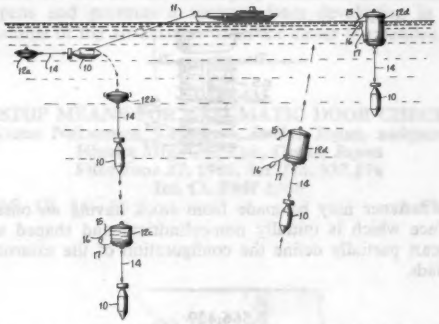
3,566,426

FLOTATION SYSTEM

William M. Davidson and Howard W. Cole, Jr., Mountain Lakes, N.J., assignors to Proteus, Inc., Mountain Lakes, N.J.

Filed Apr. 30, 1968, Ser. No. 725,398
Int. Cl. B63b *21/52*
U.S. Cl. 9—9 10 Claims

A flotation device useful for lifting a submerged load to the surface comprises a clam-shaped container made up of a top cover and a bottom cover and an inflatable bag therein. The open end of the inflatable bag is fixed to the inside of the bottom cover and the closed upper end of the inflatable bag is fixed to the inside of the upper cover, said top and bottom covers being releasably gripped together. Gas generating means preferably made up of a solid chemical compound reactive upon contact with water to generate a gas, such as hydrogen gas, is provided within the container. The container is free flooding and when the gas generating means is activated to expose said chemical compound, such as a hydride, oxide or peroxide of a metal selected from the group consisting of lithium, sodium, calcium, potassium and aluminum and mixtures thereof, to contact with water, the resulting generated gas releases the top cover from the bottom cover and is confined within and inflates the inflatable



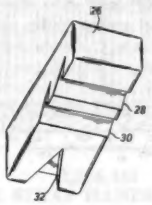
bag so as to lift the submerged object to which the device is attached.

3,566,427

WATER WALKING APPARATUS

Bill Davis and Larry T. Hodon, Austin, Tex., assignors to Bill Davis, doing business as Texas Urethanes, Austin, Tex.

Filed Feb. 12, 1969, Ser. No. 798,663
Int. Cl. A63c *15/00*
U.S. Cl. 9—310 5 Claims



For use in water, apparatus permitting the user to walk on the water through the use of said apparatus which comprises suitably shaped receptacles for receiving the feet of the user to provide suitable support thereto, and which comprises preferably rectangular members with sides which slightly taper and further preferably including means in the water to enable the user to move one foot forward with respect to the other, said means preventing backward slippage of the apparatus in the water.

3,566,428

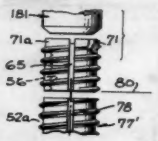
METHODS OF FORMING THREADED FASTENERS HAVING FLANGES

Robert Neuschotz, 1162 Angelo Drive, Beverly Hills, Calif. 90210

Division of application Ser. No. 750,072, Aug. 5, 1968, now Patent No. 3,513,896, which is a continuation-in-part of applications Ser. No. 597,455, Nov. 28, 1966, now Patent No. 3,405,591, Ser. No. 648,598, June 26, 1967, and Ser. No. 664,063, Aug. 29, 1967, now Patent No. 3,451,181. This application Aug. 14, 1969, Ser. No. 850,703
Int. Cl. B21d *53/24*
U.S. Cl. 10—86 14 Claims

Methods for producing threaded fasteners having external threads to be screwed into a carrier part, and having a second set of threads for connection to another member, with the fastener having a laterally projecting flange at the axially outer end of the external threads, which flange may limit threaded advancement of the fastener into the carrier part. The flange is formed by

initially providing a projection extending generally axially at the end of the external threads, and then deforming the projection to form an increased diameter flange.



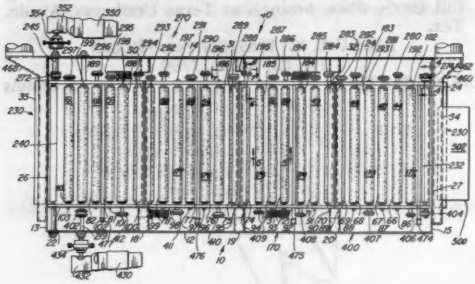
The fastener may be made from stock having an outer surface which is initially non-cylindrical and shaped to at least partially define the configuration of the external threads.

3,566,429

APPARATUS FOR CLEANING PLANAR OBJECTS

William R. Hamilton, Western Springs, Ill., assignor to Baron Blakeslee, Inc., Chicago, Ill.

Filed June 20, 1968, Ser. No. 738,576
Int. Cl. A46b *13/02*
U.S. Cl. 15—77 **14 Claims**



Relatively lightweight objects such as electronic circuit boards may be cleaned by allowing the object to pass between pairs of opposed cylindrical drive brushes that are rotated at a speed such that the object is driven in a predetermined direction at a speed equal to the tangential velocity of an outer edge portion of each brush. The drive brush bristles apply cleaning forces substantially perpendicular to the surface of the object. In addition, independently driven pairs of opposed cylindrical skimming brushes may be provided between certain pairs of the drive brushes along the path traveled by the object, and the skimming brushes are rotated in a direction tending to aid the movement of the object along the path in the predetermined direction and at a speed such that the tangential velocity of an outer edge portion of each skimming brush substantially exceeds the speed of the object, thereby applying tangential cleaning forces. Cleaning of the object is improved when carried out in the presence of a cleaning solvent.

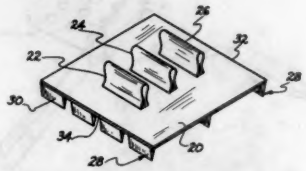
3,566,430

WINDOW SCRAPING DEVICE

Edward L. Young, 415 Amity Road, Galloway, Ohio 43119

Filed Dec. 11, 1968, Ser. No. 782,937
Int. Cl. A47l *1/06, 1/16*
U.S. Cl. 15—236 **3 Claims**

A scraping tool for removing snow or ice from vehicle windows and windshields which includes a flat, flexible base provided with a plurality of scraping means arranged on one surface thereof in spaced, substantially parallel rows. The opposite surface of the base preferably includes three spaced handle means arranged to permit the user to flex the base to conform to either a concave or



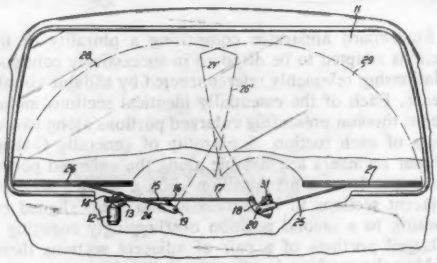
convex surface by selective pressure on certain of the handle means thereby assuring maximum contact between the scraping means and the surface being scraped.

3,566,431

WINDSHIELD WIPER ASSEMBLY

Johann Jäckel, Baden-Baden, Erich Kolb, Eisenthal, Buhl, and Hubert Mainka, Buhlertal, Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Dec. 31, 1968, Ser. No. 788,126
Claims priority, application Germany, Jan. 13, 1968, P 16 55 964.1
Int. Cl. A47l *1/00;* **B60s** *1/02*
U.S. Cl. 15—250.17 **15 Claims**



A windshield wiper assembly wherein two blades move back and forth in the same direction when the assembly is in use, wherein one of the blades is started with a delay following starting of the other blade, and wherein the one blade comes to rest in parking position while the other blade continues to move toward parking position to thereby effect stoppage of the drive. The means for moving the one blade comprises a coupling which is mounted externally of the prime mover of the windshield wiper assembly.

3,566,432

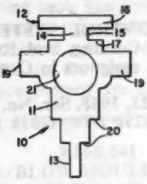
WINDSHIELD WIPER SQUEEGEE

William J. Quinlan and Lawrence L. Huver, Hastings, Mich., assignors to Hastings Manufacturing Company, Hastings, Mich.

Filed Jan. 17, 1969, Ser. No. 792,096
Int. Cl. B60s *1/32, 1/28;* **A47l** *1/02*
U.S. Cl. 15—250.36 **9 Claims**

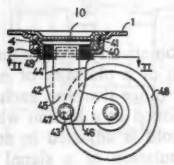
A squeegee component of a windshield wiper blade, the squeegee having an elongated elastomeric body with a longitudinal mounting portion and a longitudinal wiping lip. The body is progressively narrower in the direction of the lip and is provided in its relatively wide portion

with a longitudinal hollow core. The core is deformable in cross-section to correspondingly deform and vary the



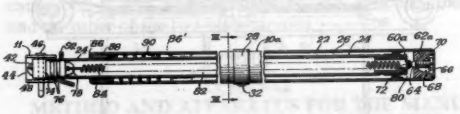
resiliency of portions of the body surrounding the core, as a function of changes in wiping forces at the lip.

3,566,433
CASTER WHEEL ARRANGEMENT WITH DAMPING DEVICE
Gunnar Erik Werner Lewin, Viggbyholm, Sweden, assignor to AB Lyckeaborgs Bruk, Torskors, Sweden
Original application Nov. 20, 1967, Ser. No. 684,160. Divided and this application June 2, 1969, Ser. No. 829,284
Claims priority, application Sweden, Dec. 2, 1966, 16,521/66; June 2, 1967, 7,736/67; June 30, 1967, 9,906/67
Int. Cl. A47b *91/00*
U.S. Cl. 16—44 **1 Claim**



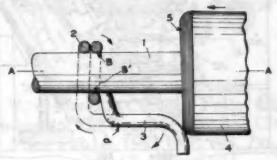
A caster wheel arrangement is provided with means for damping shocks and jars when obstacles are encountered by the caster wheel whereby the structure of the caster wheel arrangement as well as the load carried thereby is protected from damage.

3,566,434
TELESCOPIC CLOSER FOR DOORS
James J. Grinsteiner, 39 W. Forest Ave., Roselle, Ill. 60172
Filed Feb. 3, 1969, Ser. No. 795,797
Int. Cl. E05f *3/10*
U.S. Cl. 16—66 **28 Claims**



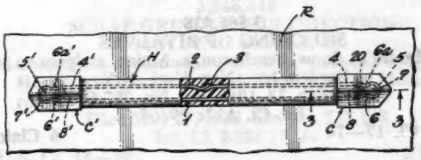
Closer for slide closure and hinged closures. The closer is of the telescopic type and, when the closure controlled thereby is open, the rate of restoration of the closure to closed position is controlled by a spring and an air cushion, both internally located in the closer. By manipulation of external devices provided, the effective spring tension and the bleed rate of the air cushion in the closer are readily adjusted. A vacuum breaking valve on one of the telescoping members automatically opens and prevents a vacuum from developing in the volume of the air cushion when the closer is extended.

3,566,435
STOP MEANS FOR PNEUMATIC DOOR CHECKS
Kazuo Nakamura, Kashihara, Osaka, Japan, assignor to Hinaka Mfg. Co., Ltd., Osaka, Japan
Filed June 27, 1969, Ser. No. 837,176
Int. Cl. E05f *5/06*
U.S. Cl. 16—85 **1 Claim**



A settable stop means for pneumatic door checks. A coiled spring having an inner diameter slightly larger than the diameter of the piston rod of the door check is placed around the rod, and the opposite end portions of the coiled spring are bent in the same direction substantially parallel to the axis of the coiled spring, and are then bent outwardly away from said axis. The coil spring fits loosely on the rod, with the end portions extending toward the cylinder of the door check, so that the stop means can be moved along the piston rod into engagement with the door check.

3,566,436
COLLAPSIBLE STRAP HANDLE FOR LUGGAGE AND THE LIKE
Lou F. Marks and Bela G. Szabo, Pittsburgh, Pa., assignors to Bruce Plastics, Inc., Moon Run, Pa.
Filed Apr. 11, 1969, Ser. No. 815,360
Int. Cl. A47b *95/02*
U.S. Cl. 16—115 **14 Claims**



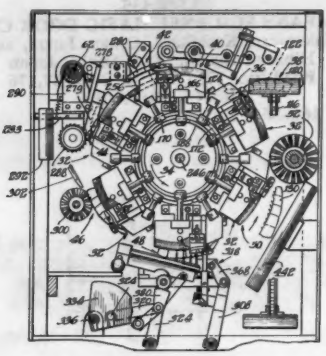
A strap handle for luggage and analogous portable receptacle bodies adapted to assume alternate operative and inoperative positions when extended and collapsed, respectively, and comprised essentially of a wire end loop of spring steel extending from each end of the handle in embracing relation to a relatively fixed spacer sleeve of hardened material mounted on the receptacle. Each loop is adapted to assume alternate positions when an intermediate narrowed portion formed therein moves relative to its mounting sleeve, as the loop is shifted inwardly when the body is lifted, to dispose the sleeve at the outer end of the loop, and outwardly when the handle is collapsed to dispose the sleeve between the narrowed portion and the inner end of each loop.

3,566,437

SHRIMP PROCESSING MACHINE AND METHOD

Gregor Jonsson, Lake Forest, Ill. (% Gregor Jonsson Associates Inc., 1520 Berkeley Road, Highland Park, Ill. 60035)

Filed Dec. 16, 1968, Ser. No. 783,807
Int. Cl. A22c *29/00*
U.S. Cl. 17—48 30 Claims



A shrimp processing machine and method including an intermittently operating conveyor from which beheaded shrimp are pulled tail first by sets of clamps on a rotary wheel turning at a uniform rate. The shrimp shells and part of the meat are slit, and the sand vein is removed by the rotary brush. The intermittently operating conveyor mechanism is driven from the rotary wheel by a Geneva drive mechanism.

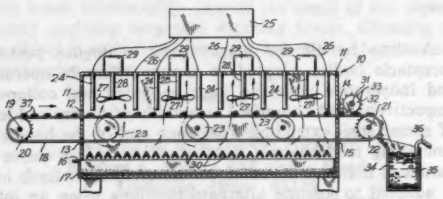
The shrimp meat is finally removed from the shell by a shell separating mechanism including a plurality of spikes which penetrate the meat and move forward at a more rapid rate than the peripheral movement of the shells as carried by the clamps on the wheel for a short distance, partially to separate the meat from the shell, the spikes then moving rearwardly relative to the direction of the wheel positively to pull the meat from the shell. Positive stripping means is provided to remove the meat from the spikes, and either a mechanical wiper or water jets move the meat from the stripper to a utilization station.

3,566,438

SHUCKING OF BIVALVES

Harold F. Snow, Scarborough, Maine, assignor to Borden, Inc., New York, N.Y.

Filed Feb. 23, 1968, Ser. No. 707,666
Int. Cl. A22c *29/00*
U.S. Cl. 17—74 6 Claims



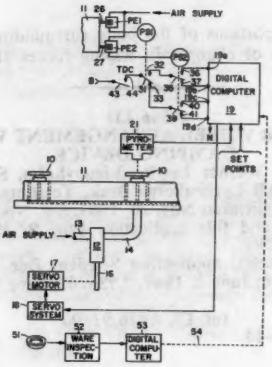
This invention relates to the method of and apparatus for separating the meats of bivalves from the shells and comprises a cell, means for continuously moving said bivalves through said cell, means for heating said cell, and means for directing a stream of high velocity heated gas upwardly about said bivalves, means for crushing said shells, and means for displacing said shells from said meats.

3,566,439

TEMPERATURE CONTROL SYSTEM FOR MOLDS

Raymond J. Mouly, Corning, and Robert L. Thomas, Painted Post, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Nov. 22, 1968, Ser. No. 778,280
Int. Cl. B29c *1/00*; G01k *17/00*
U.S. Cl. 18—4 2 Claims



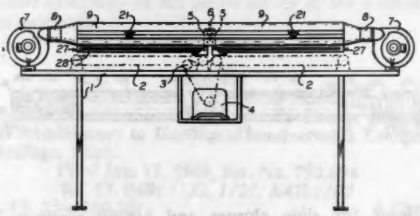
A system for automatically sensing and controlling the temperature of each of a plurality of molds to within a desired temperature range therefor, each such mold being intermittently positioned at a station where cooling fluid supplied to each mold is adjusted in accordance with a programmed manipulation of a signal representing the sensed temperature of the respective mold and a set point signal representing the desired temperature for such mold.

3,566,440

APPARATUS FOR THE MANUFACTURE OF ARTIFICIAL, NEEDLE BEARING BRANCHES

Alfred Romanowski, Kleineichen, and Wilfried Krueger, Troisdorf, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

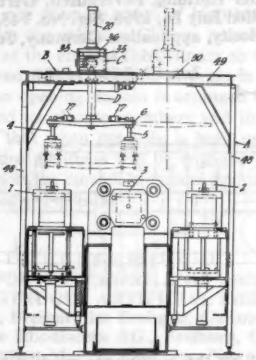
Filed Jan. 27, 1969, Ser. No. 793,946
Claims priority, application Germany, Jan. 26, 1968, P 17 53 116.7
Int. Cl. B29b *3/00*; B29c *1/00*
U.S. Cl. 18—5 8 Claims



Process for production of artificial, needle bearing branches, such as stems or twigs, from pieces formed of

a core member and needles made of thermoplastic material, projecting radially outwardly from the core member, which are in the form of cylindrical brushes, the process comprising heating the needles and drawing the cylindrical branch axially through and relative to an opening of a shaping tool. The opening is shaped so that the shaping tool works the needles during the drawing. The heating is correlated with the drawing so that needles are shaped relative to the core. The process and apparatus for practice thereof are claimed.

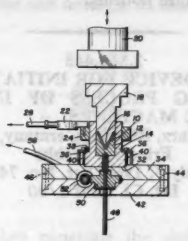
3,566,441
INJECTION/BLOW MOULDING MACHINE
Michael Thorn and William Gemmell Brackenbridge, Kingston-on-Thames, England, assignors to Blewis & Shaw (Plastics) Limited, Kingston upon Thames, England
Continuation of application Ser. No. 577,456, Sept. 6, 1966. This application June 4, 1969, Ser. No. 830,321
Claims priority, application Great Britain, May 26, 1966, 23,644/66
Int. Cl. B29d *23/03*
U.S. Cl. 18—5 **9 Claims**



The disclosure relates to an injection/blow moulding machine in which the parison stick transfer mechanism can be connected to and disconnected from the parison sticks employed in the moulds of the machine. The transfer mechanism is arranged so that a typical sequence of operations in respect of an injection mould and a pair of blow moulds served by the injection mould, is as follows: (1) the parison sticks respectively of one of the blow moulds and the injection mould are connected to the transfer mechanism, (2) after that blow mould and the injection mould have opened, simultaneously, the parison stick of the latter is transferred to the blow mould and the parison stick of the blow mould is transferred to the injection mould (i.e., after stripping off of the blown article), (3) the parison sticks of the blow mould concerned and the injection mould are disconnected, after the moulds have closed, from the transfer mechanism, and (4) the transfer mechanism then assumes a position to carry out a like transfer between the injection mould and the other of the two blow moulds.

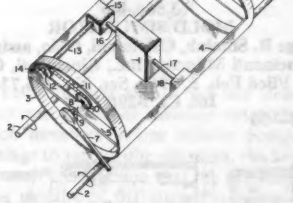
3,566,442
METHOD AND APPARATUS FOR THE MANUFACTURE OF THIN WALLED ARTICLES
John R. Hakala, Fort Worth, Tex., assignor to Harrison Jet Guns, Inc., Houston, Tex.
Filed Dec. 22, 1967, Ser. No. 692,799
Int. Cl. B30b *3/04, 11/00*
U.S. Cl. 18—16 **3 Claims**

Measured quantities of metal powder are deposited in a female mold and a male die is moved into the mold to form the metal powder into a desired article configuration. The female mold and the male die are relatively



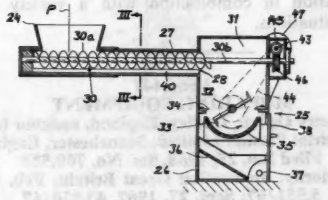
rotated and the female mold is vibrated during the forming operation in order to evenly distribute the metal powder to form an article having uniform thin walls.

3,566,443
MOLDING DEVICE
Fernando V. Guerrero, Chagrin Falls, Ohio, assignor to Continental Oil Company, Ponca City, Okla.
Filed Feb. 6, 1969, Ser. No. 796,963
Int. Cl. B29c *5/04*
U.S. Cl. 18—26 **3 Claims**



Device for rotating a mold on two perpendicular axes while simultaneously transporting it, e.g. through sequential loading, heating, cooling, and unloading zones, useful for molding large hollow objects.

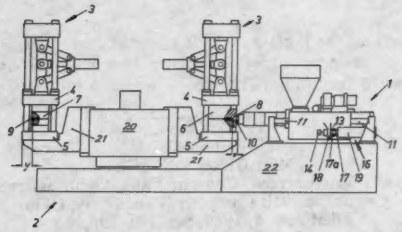
3,566,444
SCRAP GRINDER FOR INJECTION-MOLDING MACHINE
Herbert Rees, Willowdale, Ontario, Canada, assignor to Husky Manufacturing and Tool Works Limited, Toronto, Ontario, Canada
Filed May 27, 1968, Ser. No. 732,148
Int. Cl. B02c *18/44*
U.S. Cl. 18—30 **6 Claims**



A grinder with rotary knives is positioned below the mold level of an injection-molding machine and offset from the mold path, an auger driven by the knife motor extending horizontally from a hopper beneath the mold

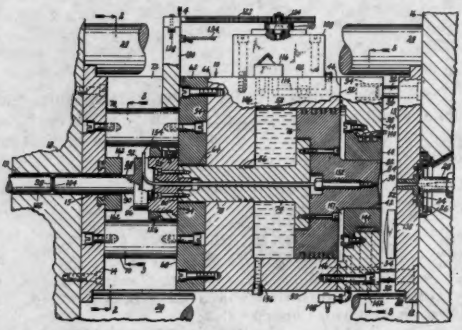
path to the grinder mouth for delivering runners dropping from the opening mold to a lateral entrance of an otherwise closed knife housing.

3,566,445
CONTROL DEVICE FOR INITIATING THE INJECTING PROCESS OF INJECTION MOLDING MACHINES
Manfred Niklarz, Rinteln, Germany, assignor to Friedrich Stubbe
Filed July 3, 1968, Ser. No. 742,352
Int. Cl. B29f 1/00
U.S. Cl. 18—30 **4 Claims**



A control device for initiating the injection step of an injection molding machine cycle, wherein the injection nozzle and the mold are moved toward and pressed against each other by means of a feed unit.

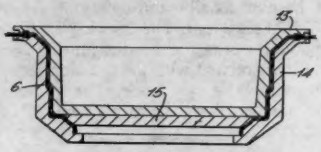
3,566,446
MOLD SIMULATOR
George R. Smoluk, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio
Filed Feb. 5, 1969, Ser. No. 796,724
Int. Cl. B29f 1/00
U.S. Cl. 18—30 **10 Claims**



An apparatus to stimulate the behavior of a large number of various injection molding machine molds the behavior of which can be reduced to a program of pressure variation in combination with a variety of flow duration situations.

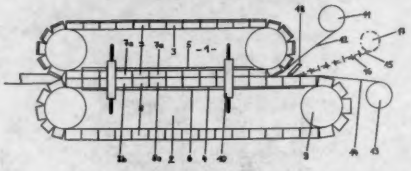
3,566,447
MOULDING EQUIPMENT
Dennis Henry Ogden, Dudley, England, assignor to British Industrial Plastics Limited, Manchester, England
Filed Jan. 25, 1968, Ser. No. 700,559
Claims priority, application Great Britain, Feb. 6, 1967, 5,551/67; Sept. 27, 1967, 43,970/67
Int. Cl. B29c 1/02
U.S. Cl. 18—35 **9 Claims**

A mould for use in a cold-moulding process comprises a pinch-off of resilient material, suitably a rubber. Better control of resin flow and reduced wear of the mould proper is obtained. Cold-press moulds are described which are of glass-reinforced polyester, with or without a plastics foam



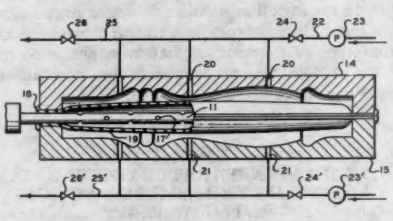
backing, moulds of plastics foam alone, and moulds adapted to accept inserts to be moulded into a moulding.

3,566,448
APPARATUS FOR THE CONTINUOUS PRODUCTION OF SECTIONS OF FOAMED MATERIALS, PARTICULARLY ON A POLYURETHANE BASE
Rudolf Ernst, Strasslach, near Munich, Germany, assignor to Maschinenfabrik Hennecke Gesellschaft mit beschrankter Haftung, Leverkusen, Germany
Filed July 16, 1968, Ser. No. 745,160
Claims priority, application Germany, July 27, 1967, M 74,954
Int. Cl. B29c 15/00
U.S. Cl. 18—4 **6 Claims**



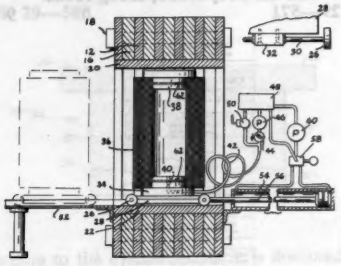
Apparatus for the continuous production of structural sections of foamed or spongy materials where a hollow space is defined between two conveyor bands disposed one over the other, which move at a speed corresponding to the reaction velocity of the foam mass and/or corresponding to the quantity of the mass, and where the hollow space is formed by split forms that abut against one another.

3,566,449
APPARATUS FOR MOLDING PLASTIC FOAM
Robert R. Goins and Dan E. Perry, Bartlesville, Okla., assignors to Phillips Petroleum Company
Filed Nov. 27, 1968, Ser. No. 779,495
Int. Cl. B29c 1/00
U.S. Cl. 18—5 **7 Claims**



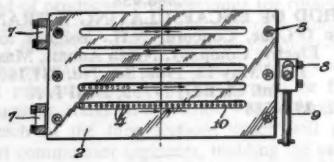
Smooth-surface, foamed plastic articles are made by charging a foam melt into a mold between restraining elastic sheets and then releasing the restraining force to allow the charge to expand to the mold walls.

3,566,450
HIGH PRESSURE CYLINDER AND PRESS STRUCTURE FOR THE CYLINDER
Albert Samuel Roberts, Rector, Pa., assignor to Kennametal Inc., Latrobe, Pa.
Filed Jan. 25, 1968, Ser. No. 700,612
Int. Cl. B29c 1/02
U.S. Cl. 18—34 6 Claims



The invention concerns a high pressure cylinder formed by winding up one or more strips of high tensile strength material to form the cylinder. Closure members are sealingly mounted at the ends of the cylinder so that pressure can be developed in the cylinder. A press in the form of a frame with an opening therein is arranged for receiving the cylinder and its closure members and the opening is of such a size that when pressure is built up in the cylinder, the closure members will be engaged by the press frame and support the closure members against movement out of the ends of the cylinder.

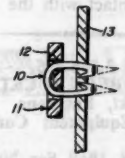
3,566,451
PROCESS FOR WIDENING AND LOOSENING CONTINUOUS ARTIFICIAL FIBER
Hans Weigand, Freiburg im Breisgau, Germany, assignor to Deutsche Rhodiaceta AG., Freiburg, Germany
Original application Mar. 1, 1967, Ser. No. 619,774, now Patent No. 3,444,592, dated May 20, 1969. Divided and this application Oct. 30, 1968, Ser. No. 794,442
Claims priority, application Germany, Mar. 2, 1966, D 49,482
Int. Cl. D01b 3/10
U.S. Cl. 19—66 2 Claims



Continuous artificial fiber strands are widened and loosened by means of a single or multiple passes through an apparatus having a plurality of rows of nozzles. Gas is blown through one row of nozzles away from the center, and is blown through the adjacent row of nozzles toward the center of the apparatus.

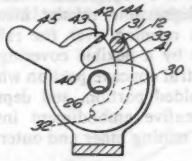
3,566,452
BUTTON HOLDER
Robert L. Hocker, 1400 Devereux Drive, Dayton, Ohio 45419
Filed Dec. 2, 1968, Ser. No. 780,401
Int. Cl. A44b 1/18
U.S. Cl. 24—103 5 Claims

A U-shaped holder adapted to secure a button on a fabric material. Sharp points are provided on the ends of the U-shaped member to enable it to penetrate the fabric so that the holder replaces the threads which normally hold the button on the fabric. The pointed ends of the holder are notched so that the points can be



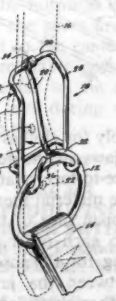
removed once they penetrate the cloth, and hooks are provided adjacent the ends so that the holder cannot be withdrawn from the fabric by normal use of the button.

3,566,453
SAFETY CATCH
George W. Kellum, Rehoboth, Mass., assignor to General Findings, Inc.
Filed Nov. 19, 1968, Ser. No. 776,885
Int. Cl. A44b 9/10
U.S. Cl. 24—157 2 Claims



A safety catch for use with a pin-like stem having a fixed member and a keeper member rotatably mounted therein, which members in one relative position present aligned openings to receive the pin stem, the keeper member being of such construction that the pressing of the pin stem into the mouths of the aligned openings will cause a relative rotation of the keeper member so as to move it to a position to lock the pin stem in the catch.

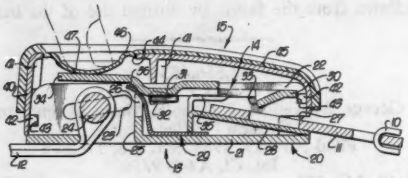
3,566,454
QUICK RELEASE BUCKLE
Albert A. Schmidt, 4717 Del Paso Court, Los Angeles, Calif. 90032
Filed Dec. 12, 1968, Ser. No. 783,229
Int. Cl. A44b 11/28, 11/24
U.S. Cl. 24—165 9 Claims



A buckle comprising an open frame bent at one end to form a hook for supporting a ring or other such member detachable from the buckle frame, and provided with a tongue member movable outwardly to contact the hooked member to thereby enclose the ring and movable inwardly

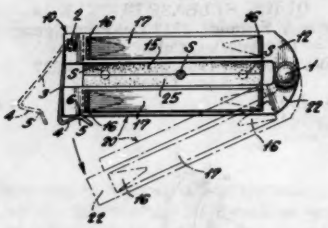
to allow release of the ring. A strap is received in the frame and a transverse retaining bar for the strap is provided proximate to the hooked member whereby the tongue member, disposed through the restrained strap, is resiliently urged into contact with the hooked member.

3,566,455
RESTRAINT BELT BUCKLE COVER
Gregory G. Kuszynski, Pasadena, Calif., assignor to American Safety Equipment Corporation, Sherman Oaks, Calif.
Filed Sept. 22, 1969, Ser. No. 859,931
Int. Cl. A44b *11/26*
U.S. Cl. 24—230 **8 Claims**



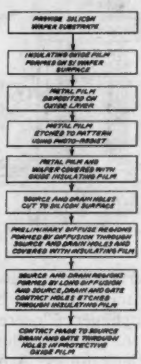
In a restraint belt buckle frame with latching mechanism including depressible release means, a semi-rigid casing having an opening over the release means continuously covered by a flexible covering having a folded portion and a central concave portion which when pressed straightens the folded portion, and depresses the release means. An alternative embodiment inserts the flexible covering between mating inner and outer casing members.

3,566,456
CLOTHES HANGER CLAMP AND GARMENT BAG ASSEMBLY
Wallace London, 302 S. Central Ave., Baltimore, Md. 21202
Continuation-in-part of application Ser. No. 744,563, July 12, 1968. This application Feb. 12, 1970, Ser. No. 10,928
Int. Cl. A44b *21/00*; B65d *85/18*
U.S. Cl. 24—248 **10 Claims**



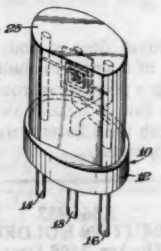
A clamping assembly for clothes hangers constituted by a pair of clamping jaws in the form of C-shaped sheet metal channels in face-to-face relation, each channel seating a block of flexible material therein with one edge protruding beyond the open face of the channel, said channels being pivoted to each other at one end thereof to permit their spreading for the insertion of one or more garment hangers between the jaws followed by their clamping together with a clasp device disposed at the opposite end of the channels. The channels are fitted with prongs, fastening flanges or the like, to permit the ready affixation thereof to garment bags in the course of their production or thereafter, to provide a tight seal for the bags and reliable support for the gament hangers therein, making possible the facile handling and transport thereof.

3,566,457
BURIED METALLIC FILM DEVICES AND METHOD OF MAKING THE SAME
William E. Engeler, Scotia, N.Y., assignor to General Electric Company
Continuation-in-part of application Ser. No. 675,225, Oct. 13, 1967. This application May 1, 1968, Ser. No. 725,683
Int. Cl. B01j *17/00*; H01g *13/00*
U.S. Cl. 29—571 **9 Claims**



Electrical conductors and field plates utilized in integrated circuit components are buried in insulating media by forming an insulated film on the semiconductor substrate, depositing a metal thereover which is nonreactive with the insulator at temperatures of the order of 1100° C., and covering the conductive film with another insulating film. After all fabrication steps for the integrated circuit device are completed, contact to the metal.ic layer is made by etching a hole through the last deposited insulating film at one point with an etchant which is nonreactive with the metallic film, and metalizing the device in that region, making contact with the buried conductor. Such buried conductors may be utilized as conductors in printed circuit and monolithic semiconductor devices, as capacitor plates, and as gate electrodes in field-effect transistors.

3,566,458
METHOD OF ENCAPSULATING A TRANSISTOR
Attillio O'Cone, Concord, N.H., assignor to Sprague Electric Company, North Adams, Mass.
Filed May 22, 1968, Ser. No. 731,100
Int. Cl. B01j *17/00*; H01l *1/10*
U.S. Cl. 29—588 **6 Claims**



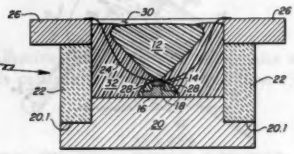
The method of encapsulating a transistor involving mounting a transistor to the lead posts of a header. The header is a plurality of lead posts fixed in position by a first insulative material. Encapsulating the transistor in a second insulative material and selectively solvent removing the first insulative material.

3,566,459

PRESSURE SENSITIVE TRANSDUCERS

Wilhelm Rindner, Lexington, Americo A. Iannini, Marlboro, and Andre Garfein, Brighton, Mass., assignors to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed June 19, 1968, Ser. No. 738,315
Int. Cl. B01j 17/00; H01l 1/10
U.S. Cl. 29—588 3 Claims



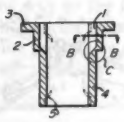
According to the disclosure, there is disclosed a miniature electromechanical junction transducer, the operation of which is based on piezojunction effect. The mechanical input coupling member, in the subject invention, as distinguished from the prior art, is formed in situ and spread over the top of the mesa structure to form an exact duplicate of the mesa surface at the areaof contact.

3,566,460

METHOD OF PRODUCING COMMUTATOR FOR ROTARY ARMATURES

Terumoto Yamaguchi, Anjo-shi, Japan, assignor to Nippon Denso Company Limited, Kariya-shi, Japan

Filed Feb. 5, 1969, Ser. No. 796,811
Claims priority, application Japan, Apr. 19, 1968, 43/26,309
Int. Cl. H01r 43/00
U.S. Cl. 29—597 1 Claim



A method of producing a commutator for rotary armatures, which comprises bulging the wall of a flanged end portion of a flanged tube of electrically conductive material radially outwardly to form longitudinally extending recesses at portions where windows are to be formed, forming engaging hooks on the inside wall surface of said tube for each of the tube sections which will provide independent commutator segments, molding the said tube with an insulating material and thereafter punching the flange of the tube in such a manner as to form wire-hooking lugs and to remove the outwardly bulged portions of the tube defining said recesses.

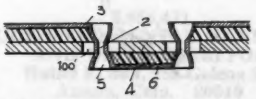
3,566,461

METHOD OF MAKING A MAGNETIC CIRCUIT ELEMENT

Michel Carbonel, Paris, France, assignor to CSF-Compagnie Generale de Telegraphie Sans Fil

Filed July 2, 1968, Ser. No. 742,087
Claims priority, application France, July 4, 1967, 113,054
Int. Cl. H01f 7/06
U.S. Cl. 29—604 10 Claims

A method for manufacturing integrated circuit elements, including a ferromagnetic plate with an aperture through which extend the associated conductors, comprises essentially the steps of depositing copper on the two sides of the plate, forming holes in the sandwich thus obtained, electrodepositing, with the copper as an anode, a conductor along a pattern alternately extending



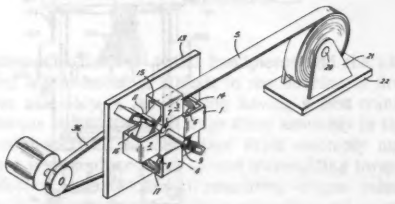
on the two sides of the said plate, and through said holes; forming the aperture in the plate; removing the remaining copper and inserting between the plate and the conductor an insulating material.

3,566,462

METHOD AND APPARATUS FOR MAKING TOROID TRANSFORMER

Buell Moore, Houston, Tex., assignor to Esquire, Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 466,406, June 23, 1965, which is a continuation-in-part of application Ser. No. 369,395, May 22, 1964. This application Jan. 23, 1969, Ser. No. 814,218
Int. Cl. H01f 5/00, 7/06; H02k 15/04
U.S. Cl. 29—605 31 Claims



Apparatus and method are provided for making a transformer core of toroid shape. The apparatus includes a template to which performed transformer coils are detachably connected, a plurality of rotatable elongate posts extending through the template and on one side of the template serving to support strip material from which the core is constructed and properly direct such material into the coils, and on the other side having gear teeth for receipt of a ring gear so that the posts may be rotated in unison. An alternate embodiment provides gears mounted in housings, with the housings operable by screws in elongate slots, so that the gears are moved inwardly or outwardly with respect to the center of the template. In another embodiment, rotatable posts are provided which are disposed perpendicular to the core strip, and upon which the core strip rests during winding, in order to prevent slippage of the strip.

3,566,463

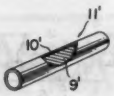
METHOD OF PRODUCING A CIRCUIT BREAKER SWITCH

Hiroshi Kobayashi and Eiji Fujimoto, Tokyo, Japan, assignors to Meidensha Electric Mfg. Co., Ltd., Tokyo, Japan

Filed Feb. 15, 1968, Ser. No. 705,822
Claims priority, application Japan, Dec. 20, 1967, 42/82,085
Int. Cl. H01h 11/00
U.S. Cl. 29—622 9 Claims

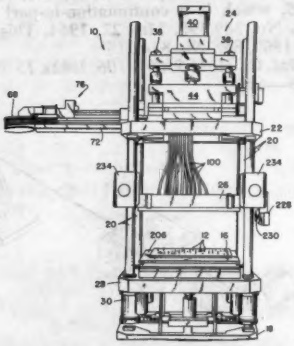
Contact elements for a vacuum circuit breaker are made from a diffusion alloy prepared by coating a copper, silver or aluminum base stock with bismuth, lead, tellurium,

indium, thallium or tin by vacuum deposition, immersion or plating, and by heating tightly packed portions of the coated stock to a temperature below the melting point of the primary component in a vacuum or in a reducing



atmosphere until the coating material diffuses into the base to produce an electrode material not prepared so simply to a reproducible composition by other alloying methods.

3,566,464
APPARATUS AND METHOD FOR MOUNTING WIRE WRAP PINS ON CIRCUIT BOARDS
Johannes C. W. Bakermans, New Cumberland, Pa., assignor to Berg Electronics, Inc., New Cumberland, Pa.
Filed Dec. 5, 1968, Ser. No. 781,421
Int. Cl. H05k *3/00, 13/04*
U.S. Cl. 29—625 **20 Claims**

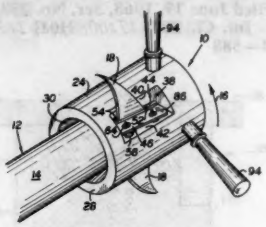


Apparatus and method for simultaneously mounting a number of wire wrap pins in a predetermined pattern on a circuit board. The pins are severed from a carrier strip and fall down guide tubes to a plate in which they are held in the desired pattern. The plate is then lowered and a circuit board is positioned on the plate with a pin-receiving hole located above each pin in the plate. The plate is then raised to move the circuit board up against a second fixed plate and drive the pins into their respective circuit board holes.

3,566,465
FORMING OF CONNECTOR ON A WIRE AND ASSEMBLY THEREWITH
Al Weiner, 2111 Regatta Ave., Sunset Island 4, Miami Beach, Fla. 33140
Filed May 16, 1969, Ser. No. 825,332
Int. Cl. H01r *43/00*
U.S. Cl. 29—628 **5 Claims**

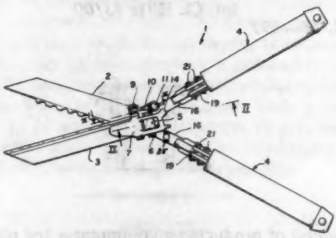
The end portion of a wire is flattened to produce a connector section which then has a hole made therethrough to accommodate a second wire which is secured thereto.

3,566,466
CABLE REDUCING TOOL
James J. Matthews, Hicksville, N.Y. (Landing Hill Road, East Haddam, Conn. 06423)
Filed Apr. 17, 1969, Ser. No. 816,911
Int. Cl. B21f *13/00*
U.S. Cl. 30—90.1 **8 Claims**



A cable reducing tool and a cutting implement for the same, the cutting implement having the trailing cutting end of its cutting edge in a clearance position such that the finish of the reduced cable is not marred, and the cable reducing tool may employ one or more of these noteworthy cutting implements to effectively produce the reduced cable not only with a substantially smooth finish but with minimum wear of the cutting implements.

3,566,467
HEDGE SHEARS
David H. Keiser, Jr., 53 Park Road, Wyomissing Hills, Pa. 19610
Filed Apr. 30, 1968, Ser. No. 725,296
Int. Cl. B26b *13/00*
U.S. Cl. 30—257 **1 Claim**



Hedge shears in which one of the blades pivotally moves away from the plane of the other under the resistance of a spring as the blades are moved to the closed position in the cutting of a hedge. Adjustable handles are provided which allow adjustment of the length thereof as well as inclination with respect to the plane of the blade to facilitate cutting of the hedge.

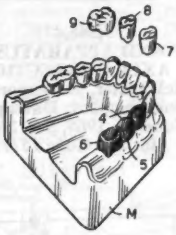
3,566,468
CUTTER FOR POWER-OPERATED SHAVERS AND METHOD OF MAKING THE SAME
Werner Messinger, Kronberg, Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Germany
Filed May 27, 1968, Ser. No. 732,421
Claims priority, application Germany, May 31, 1967, P 15 53 658.0
Int. Cl. B26b *19/04*
U.S. Cl. 30—346.51 **13 Claims**

A mobile cutter for use in power-operated shavers is assembled by temporarily mounting and fixedly holding a set of parallel steel blades in a magazine and by forcibly introducing longitudinally spaced portions of solid or hollow supporting rods of aluminum into separate lines of recesses which are formed in the blades. The blades penetrate into aluminum during forcible introduction of

rods into the respective lines of recesses. The connections between the blades and the rods can be reinforced by a

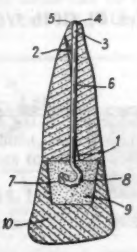
suitable adhesive. The planes of the blades and the axes of the rods can make an acute angle or a right angle.

3,566,469
METHOD OF OBTAINING DENTAL BRIDGE APPLIANCES BY MEANS OF PREFORMED CROWNS AND THE RELEVANT TOOTH SHAPING CROWNS
Ugo Pelizzari, Via C. Mameli 10, Busto Arsizio, Italy
Filed Feb. 6, 1969, Ser. No. 797,122
Int. Cl. A61c *13/00*
U.S. Cl. 32—2 **1 Claim**



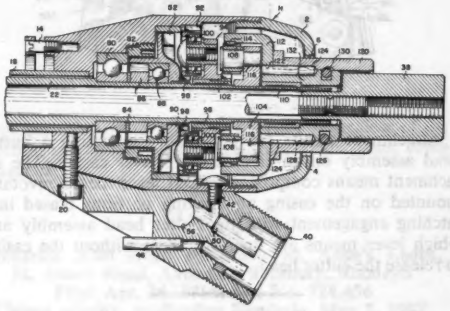
Manufacture of dental prosthetic appliances involves the placing of pieces of wax or the like having the rough shape of missing teeth into the gaps of these teeth in a plaster cast, then placing over these wax pieces caps having the shape of the missing teeth and removing excess wax.

3,566,470
IMPLANT METHOD FOR SECURING ARTIFICIAL TEETH
Jacques Scialom, 15 Ave. Francis Berthier, 94 Le Parc Saint-Maur, France
Continuation-in-part of application Ser. No. 253,113, Jan. 22, 1963. This application Feb. 16, 1968, Ser. No. 705,974
Claims priority, application France, Feb. 20, 1967, 95,581
The portion of the term of the patent subsequent to June 4, 1985, has been disclaimed
Int. Cl. A61c *13/00*
U.S. Cl. 32—10 **1 Claim**



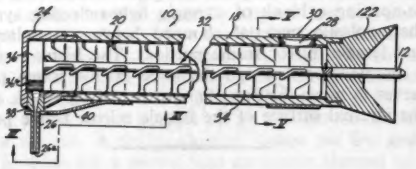
A self-drilling implant adapted to be drilled into the root of a tooth through an end of a reduced diameter while its outer end is bent to form a head over which is fitted an artificial tooth. The implant is made of a metal such as steel the Vickers hardness of which ranges between 300 and 500 and is preferably equal to above 350.

3,566,471
MULTISPEED DENTAL HANDPIECE AND DRIVE THEREFOR
Walter E. Bull, 555 Galena St., Aurora, Colo. 80010
Filed Apr. 1, 1968, Ser. No. 717,590
Int. Cl. A61c *1/05;* **F16h** *57/10*
U.S. Cl. 32—26 **10 Claims**



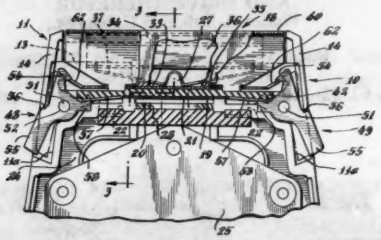
A multispeed drive for dental handpieces and the like comprising a first housing; a shaft in the housing; a first stage drive assembly in the housing having a first transmitting torque value; a second stage drive assembly in the housing connected to the first stage drive assembly and to the drive shaft and having a second transmitting torque value differing from the first transmitting torque value; means for driving the first stage drive assembly; and means for shorting out the second stage drive assembly having operative and non-operative positions; thereby to selectively drive the drive shaft at different speeds.

3,566,472
DENTAL CAVITY FILLING INSTRUMENT
Harold J. Mohlman, 163 North Ave., Battle Creek, Mich. 49017
Filed Feb. 27, 1969, Ser. No. 802,770
Int. Cl. A61c *5/04*
U.S. Cl. 32—60 **4 Claims**



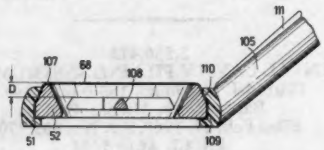
A device for dental use in the nature of a dentist's handpiece and attachable to the output of a dental power drilling unit, including a tubular body having an inlet near one end for receiving the constituents of dental filling material, an outlet nozzle at the other end for discharging such material, and an internal auger for intermixing the constituents while moving them from the inlet to the outlet and discharging the intermixed material directly into a prepared tooth cavity.

3,566,473
CUTTER HEAD ATTACHMENT MEANS
David R. Locke and John F. Daniels, Bridgeport, Conn., assignors to Sperry Rand Corporation, New York, N.Y.
Filed June 11, 1968, Ser. No. 736,126
U.S. Cl. 30—43.92 5 Claims



Attachment means for detachably mounting a cutter head assembly on an electric dry shaver casing. The attachment means comprising spaced lever means pivotally mounted on the casing and having portions biased into latching engagement with the cutter head assembly and which lever means are operable from without the casing to release the cutter head.

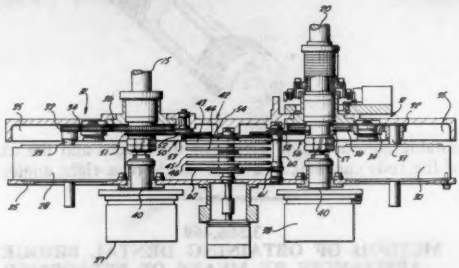
3,566,474
DENTIST'S MIRROR
Gerhard Zühlke, Geroldswil, and Paul Brandli and Max Spalti, Zurich, Switzerland, assignors to Zuhlke & Brandli A.G., Zurich, Switzerland
Original application Apr. 25, 1969, Ser. No. 819,404. Divided and this application July 14, 1969, Ser. No. 841,289
Claims priority, application Switzerland, Aug. 14, 1968, 12,230/68
Int. Cl. A61c 3/00
U.S. Cl. 32—69 13 Claims



A mirror including an elongated handle, the mirror comprising a blank of strongly light-reflecting synthetic thermoplastic material clamped between annular male and female mirror frame portions. The blank comprises a marginal portion and the male mirror frame portion serves to move the marginal portion of the blank against the internal surface of the female mirror frame portion.

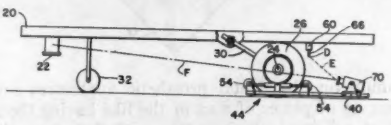
3,566,475
PRECISION PLOTTER
Stephen R. Seccombe, Northridge, Calif., assignor to Computer Industries, Inc., Sherman Oaks, Calif.
Filed Apr. 25, 1969, Ser. No. 819,325
Int. Cl. G01b 21/00
U.S. Cl. 33—1 26 Claims

A precision plotter is disclosed having a movable arm extending over the plotting table, the arm is transversely driven along the X axis by a lead screw rotatably mounted along the one edge of the table. A pen carriage is slidably mounted on the movable arm and is driven by means of a drum and cable means. The drum is attached to the movable arm and is axially movable along a splined shaft to be rotatably driven thereby. The lead screw and splined shaft are rotatably driven by motor means located within a gear box assembly. The gear box assembly also includes



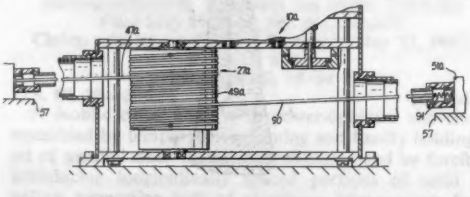
a pair of encoders coupled to the lead screw and splined shaft for monitoring the angular rotation thereof. Cam actuated correcting means are also located within the gear box assembly to compensate for tolerances in the mechanical structure of the plotter.

3,566,476
METHOD OF AND APPARATUS FOR VEHICLE AXLE CORRECTION
Fred Awbrey McWhorter, Davenport, Iowa, assignor to Bee Line Company, Davenport, Iowa
Filed June 11, 1968, Ser. No. 736,041
Int. Cl. G01c 15/12
U.S. Cl. 33—46 12 Claims



A method of and apparatus for ascertaining and correcting perpendicularity of a vehicle axle to the fore-and-aft centerline of the vehicle frame or body by projecting a beam from a reference line parallel to the axle and correctively adjusting the reference line until the beam centers on a preselected reference point on the centerline so that the axle correctly tracks with the frame, especially in semi-trailers and the like.

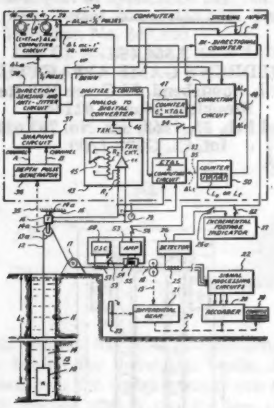
3,566,477
MEASURING INSTRUMENT
Kenneth James Williams, 31 Hillcrest Gardens, Hinchley Wood, Surrey, England
Filed Apr. 16, 1968, Ser. No. 721,866
Claims priority, application Great Britain, Apr. 19, 1967, 18,013/67; July 18, 1967, 32,904/67; Sept. 26, 1967, 43,793/67
Int. Cl. G01b 5/02
U.S. Cl. 33—125 6 Claims



A measuring instrument comprising a drum and a wire or tape, one end of which is attached to the drum and the other end of which is attached to a member which is

movable relative to the drum. The drum is spring urged to rotate the drum about its axis in a sense to wind the wire or tape on to the drum and rotation of the drum is indicated through a gear train on a series of dials. The wire or tape is wound on to a helical track on the surface of the drum, the angle of the wire to the horizontal is constant and equal to the track helix angle throughout winding of the wire or tape on and off the drum and the end of the wire fixed to the member moves in a fixed plane.

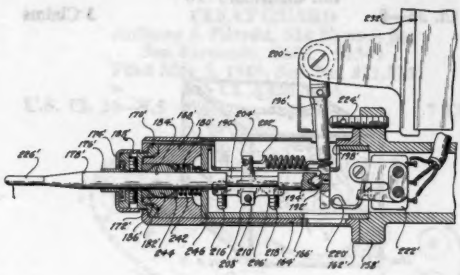
3,566,478
DEPTH CONTROL METHODS AND APPARATUS FOR BOREHOLES
F. David Hurlston, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.
Filed June 24, 1968, Ser. No. 739,330
Int. Cl. G01b *3/02*
U.S. Cl. 33—142 **18 Claims**



In accordance with an illustrative embodiment of the invention, methods and apparatus for accurately determining the true depth of a tool supported in a borehole by an elastic cable are described. To accomplish this, a sheave wheel at the surface of the earth measures cable movement and generates pulses representative of incremental cable movement. The tension on the cable at the surface of the earth is measured and used in combination with certain calibration corrections to generate correction pulses which are either added to or subtracted from the incremental cable movement pulses to produce corrected cable movement pulses. These corrected pulses can then be used to drive a suitable recording device as a function of true cable movement or to cause reference marks to be placed on the cable so that the cable can be later used for depth control purposes apart from the pulse correction computing system.

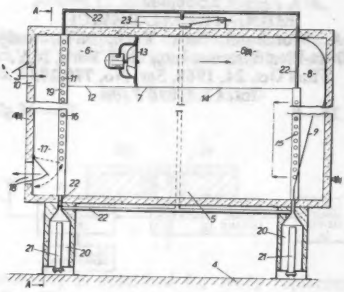
3,566,479
ELECTROMECHANICAL SURFACE SCANNER
George Pascoe, Dearborn, and Earle H. Stevenson, Detroit, Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed May 15, 1967, Ser. No. 638,382
Int. Cl. G01b *13/08*
U.S. Cl. 33—174 **1 Claim**

This specification describes a scanner for measuring the coordinates of points on a three-dimensional surface. It includes a surface contacting probe and a closed-loop probe position control for adjusting the probe and for maintaining a predetermined pressure on the probe while recording the coordinate data. Universal movement of the



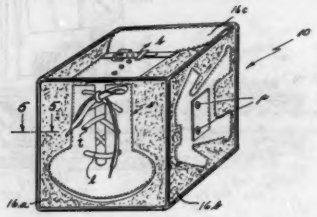
probe permits a proper control response regardless of the direction of the normal to the surface at the point being measured.

3,566,480
KILNS
Frederick Noel Hope Johnstone, St. Anne's Lodge, St. Anne's Road, Avondale, Salisbury, Rhodesia
Filed Apr. 26, 1968, Ser. No. 724,456
Claims priority, application Rhodesia, May 1, 1967, 178/67
Int. Cl. F26b *19/00*
U.S. Cl. 34—219 **2 Claims**



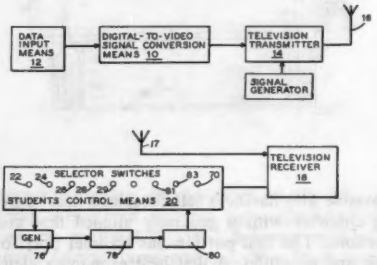
A portable kiln having a self-contained heat source and heating chamber with a generally aligned first and second portions. The first portion has an inlet port for ambient air and an outlet. A first heat exchanger element is adjacent the inlet with a duct enclosing the first heater element and leading from the inlet to the outlet. A fan is in the duct. The second portion has an inlet for the heated air from the fan. A drying chamber below the first and second portions has a second heat exchanger element adjacent thereto and a half-venturi type duct leading from the fan to the second heat exchange element so that heated air from the fan passes over the second heat exchanger element to produce a constant velocity airstream in the drying chamber. An adjustable outlet damper is provided adjacent the drying chamber and a duct connecting the drying chamber with the inlet of the first portion of the heating chambers, as well as with the exterior of the kiln, to selectively adjust the amount of air being recirculated and exhausted.

3,566,481
CHILD'S EDUCATIONAL TOY
Wanda K. Causer, 35387 Grover Road, Eastlake, Ohio 44094
Filed June 6, 1968, Ser. No. 735,158
Int. Cl. G09b *1/16*
U.S. Cl. 35—8 **3 Claims**



An educational toy to teach a child the manipulation of various articles of clothing required to enable the child to learn how to clothe himself. The toy is pillow-like in construction and sufficiently small in size to be easily carried and manipulated by a young child, as for example three years of age. The pillow partakes of any number of geometric shapes such as cubic, pyramidal, prismatic or the like, and has a plurality of faces or sides. A simulated article of clothing is attached to the faces or sides of the pillow, each article requiring the child to perform a dressing and/or undressing task such as operate a zipper; button and unbutton a shirt; buckle and unbuckle a belt; tie, untie and thread a shoelace; open and close snap-type fasteners and put on a pair of gloves.

3,566,482
EDUCATIONAL DEVICE
Charles A. Morchand, New York, N.Y., assignor to Data-Plex Systems, Inc., New York, N.Y.
Filed Oct. 24, 1968, Ser. No. 770,275
Int. Cl. G09b *7/08*
U.S. Cl. 35—9 **5 Claims**



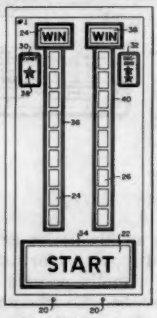
The device generates a group of signals representing a plurality of items of information arranged to form a composite picture on the cathode ray tube of a remote receiver. The receiver includes switches for selecting portions of the composite picture for display.

3,566,483
EDUCATIONAL APPARATUS
Solomon Axelrod, New York, N.Y. (28 Metropolitan Oval, Parkchester, Bronx, N.Y. 10462)
Filed Jan. 23, 1969, Ser. No. 793,402
Int. Cl. G09b *19/08*
U.S. Cl. 35—35 **4 Claims**

Educational apparatus in the form of a card having a front element with a viewing opening and a rear element having first and second indicia spaced from each other a predetermined distance, said front and rear elements being interconnected for relative movement to a first

position in which the first indicia is exposed through the viewing opening and to a second position in which the second indicia is exposed through the viewing opening.

3,566,484
CHILDREN'S GAME APPARATUS
Nancy L. Sonnabend, 24 Green Hill Road, Brookline, Mass. 02146
Filed Feb. 23, 1968, Ser. No. 707,681
Int. Cl. G09b *1/00*
U.S. Cl. 35—8 **8 Claims**

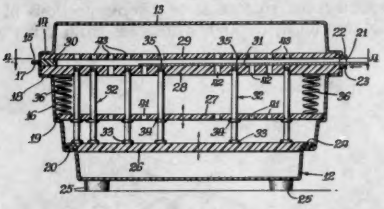


This invention relates to apparatus for playing an instructional series of games. The apparatus is constructed and arranged to enable a very young chlid to learn, by playing the games in sequence, the necessary abstract concepts required to play conventional board games. The preferred embodiment of the invention includes a game board having printed thereon three different playing surfaces, two sets of counters, each of a different color, and a container therefor cards to provide random counts for the players and to determine the order of play, a card holder, counters for counting the number of times a path has been traversed and a holder therefor. By learning to play each of the three games in sequence a young child will readily learn to play conventional board games.

3,566,485
EXAMINATION PAPER GRADER
Kenneth G. Zietlow, 1050 Flake Drive, Palatine, Ill. 60067
Filed Oct. 1, 1969, Ser. No. 862,746
Int. Cl. G09b *3/00*
U.S. Cl. 35—488 **10 Claims**

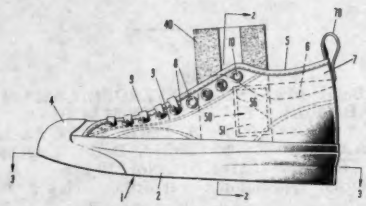
An examination paper grader in which completed preprinted examination papers are inserted into a box

and by applying a pressure downwardly on the top of the box a plurality of prearranged punches cause holes to



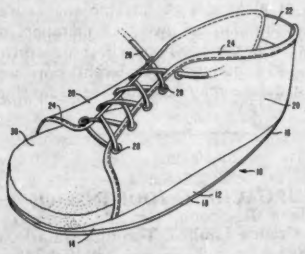
be punched in the preprinted examination papers adjacent each correst answer.

3,566,486
SNEAKER
David H. Conway, 368 S. Goodman St., Rochester, N.Y. 14607
Continuation-in-part of application Ser. No. 608,096, Jan. 9, 1967, now Patent No. 3,464,125. This application Aug. 12, 1969, Ser. No. 849,803
Int. Cl. A43b *13/42;* A61f *5/00*
U.S. Cl. 36—2.5 **3 Claims**



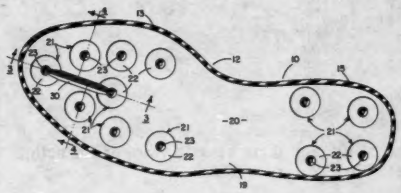
An athletic sneaker having a wedge extending from the heel to just behind the metatarsal heads. An inner heel pad positioned over the wedge extends one half its length on its inner border and is slightly less than one half its width. An outside pad extends ⅜ the length of the wedge and is centered with a transverse line aligned with the end of the inner heel pad.

3,566,487
CAST SHOE
Leroy E. Beightol, 7290 W. 90th St., Los Angeles, Calif. 90045
Filed Nov. 12, 1969, Ser. No. 875,828
Int. Cl. A43b *00/00*
U.S. Cl. 36—2.5 **6 Claims**



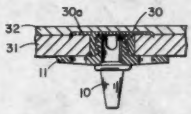
This patent describes a novel shoe intended to be worn over or in conjunction with an orthopedic cast comprising a full, rigid platform which is thicker at the center than at the heel and toe to form a curved rocker-like lower surface, a thin resilient sole covering said lower surface, and a soft flexible upper, said upper preferably is open-toed and has two side flap portions connected to the sides of said platform and being adapted to be secured to each other over the arch of the foot, the inside surface of said platform carrying a layer of resilient flexible material.

3,566,488
CLEAT GUARD
Anthony J. Pilarski, 534 Newton St., San Fernando, Calif. 91349
Filed May 5, 1969, Ser. No. 821,573
Int. Cl. A43b *3/16*
U.S. Cl. 36—7.5 **7 Claims**



This invention provides a shoe cleat protective device that includes a sole portion of flexible material including in its upper surface a plurality of spaced recesses in the pattern of the cleats of a shoe and dimensioned to substantially complementarily receive the cleats, with a longitudinal groove extending rearwardly from the forwardmost recess to allow the forward cleat to enter the forward recess by sliding motion, and an upper extending from the sole portion to engage the upper of the shoe. A layer of harder material may be included beneath the recesses to prevent the points of the cleats from punching through.

3,566,489
REPLACEABLE SPIKE FOR SHOES
Robert C. Morley, 55 Chicago Ave., Columbus, Ohio 43222
Continuation-in-part of application Ser. No. 767,212, Oct. 14, 1968. This application July 29, 1969, Ser. No. 859,224
Int. Cl. A43c *15/00*
U.S. Cl. 36—67 **4 Claims**

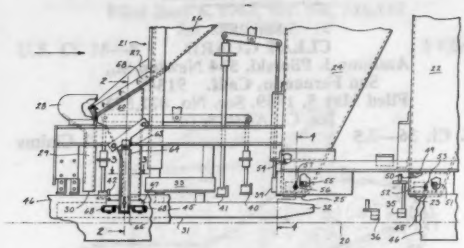


An assembly is described for ready replacement of a shoe spike. The assembly comprises a one or two piece anchor extending through the outer sole and having a flange on the outer sole and a replaceable spike member locked into the retainer member by terminal split finger protuberances.

3,566,490
APPARATUS FOR LAYING CONCRETE PLANKS WITH EXPOSED AGGREGATE TOP AND EDGE SURFACES
Robert H. Nagy, 1720 Arrowhead Court, Brookfield, Wis. 53005
Filed June 10, 1968, Ser. No. 735,899
Int. Cl. B28b *7/00*
U.S. Cl. 25—41 **10 Claims**

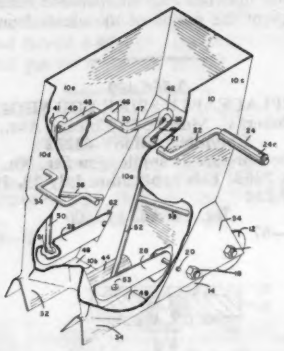
A movable frame equipped for travel lengthwise of a concrete plank being formed, and having hoppers for discharge of concrete in layers, one over the other, with the top layer being formed of exposed aggregate to provide an ornamental surface effect, there being baffling means for keeping a narrow, longitudinally-extending zone adjacent one longitudinal edge of the plank free of the lower layers of concrete, and there being means for thereafter diverting some of the aggregate material into

said longitudinal zone to fill the latter so as to also provide an ornamental surface effect upon a longitudinal edge



of the plank, and there being a vibrator for acting on the material in said narrow zone.

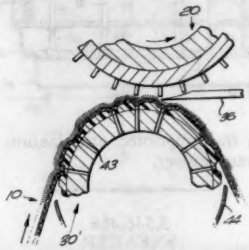
3,566,491
MORTAR SPREADING MACHINE
Albert M. Bukey, Rte. 1, Alexandria, Ohio 43001
Filed June 21, 1968, Ser. No. 740,825
Int. Cl. B28b *19/00*
U.S. Cl. 25—118 **7 Claims**



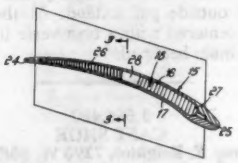
This invention relates to a machine for the spreading of mortar on masonary building material such as concrete blocks, brick, stone and the like. Specifically, the mortar spreader machine encompasses rollers adapted to be rolled on a first row of masonry material. The rollers in turn are secured to a hopper that includes a fore and aft spreader and means for advancing and feeding the mortar from the hopper to the spreader. The machine in operation is pushed (rolled) along the row of masonry material with one hand and the mortar fed to the block by the action of the other hand. As the machine is pushed, the mortar is evenly and uniformly spread on the masonry material.

3,566,492
PATTERN SHEARING APPARATUS
Wilfred N. Hadley and William J. Holm, Springfield, Vt., assignors to Riggs & Lombard, Inc., Lowell, Mass.
Filed June 20, 1968, Ser. No. 738,674
Int. Cl. B06c *23/02*
U.S. Cl. 26—16 **1 Claim**

Pile type fabrics, such as corduroys and the like, are provided with embossed patterns formed in the pile surface. The material is fed through a shearing machine which is provided with an embossed roller in place of the conventional cloth rest. The material is held tightly against the embossed roller surface so that some portions of the cloth pile are shorn to heights different from other portions to produce a pattern over the fabric surface corresponding to the design on the roller. The roller comprises a core over which is mounted a replaceable plastic sleeve on the outer surface of which is embossed the design.



3,566,493
METHOD OF MAKING AN AEROFOIL-SHAPED BLADE FOR A FLUID FLOW MACHINE
Michael Poucher and James A. Petrie, Derby, England, assignors to Rolls-Royce Limited, Derby, England
Filed Apr. 2, 1968, Ser. No. 718,125
Claims priority, application Great Britain, May 5, 1967, 21,077/67
Int. Cl. B23p *15/02, 15/04*
U.S. Cl. 29—156.8 **19 Claims**

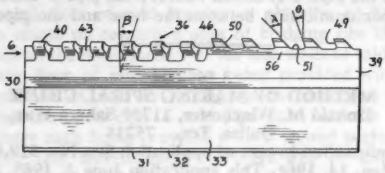


A method of making a gas turbine engine blade comprises forming the blade of two wall members which are bonded to each other and to honeycomb structure disposed between the wall members. Different portions of the honeycomb structure may have different densities.

3,566,494
BROACHING TOOL INSERT
George William Robinson, Rexdale, Ontario, Canada, assignor to Orenda Limited, Toronto, Ontario, Canada
Filed Aug. 6, 1968, Ser. No. 750,705
Claims priority, application Great Britain, Mar. 4, 1968, 10,476/68
Int. Cl. B23p *15/42;* **B26d** *1/04*
U.S. Cl. 29—95.1 **7 Claims**

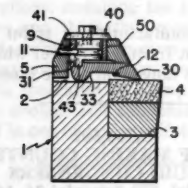
Broaching machine finishing tool insert, particularly for internal broaching of curvilinear forms in hard-to-machine materials wherein a very high standard of dimensional accuracy and surface finish is required, is

formed with a plurality of groups of cutting teeth which finish cut selected portions of the surface sequentially



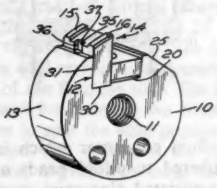
instead of taking a full-form cut on each tooth as in normal practice.

3,566,495
ADJUSTABLE CLAMPING DEVICE FOR TOOL HOLDERS
Marcel Delattre and Gerard Romagnolo, Echirolles, and Georges Notari, Monte Carlo, Monaco, assignors to Ugine-Carbone, Paris, France
Filed Nov. 14, 1968, Ser. No. 775,833
Claims priority, application France, Nov. 15, 1967, 128,292
Int. Cl. B26d *1/00*
U.S. Cl. 29—96 **5 Claims**



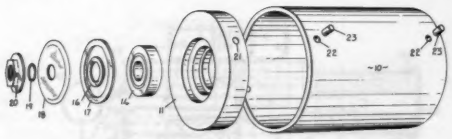
An adjustable clamping device for securing cutting tools or tips to the shank of a tool holder comprising a clamping member and a chip breaker positioned within a guideway provided therefor in the clamping member. The chip breaker can be positioned within the guideway by turning a cam journaled in the clamping member and engaged in the chip breaker.

3,566,496
FORM TOOL
Mitchell Kezirian, Cranston, R.I., assignor to Precision Industries, Inc.
Filed June 3, 1968, Ser. No. 734,000
Int. Cl. B23g *5/00, 5/18;* B26d *1/12, 1/00*
U.S. Cl. 29—102 **4 Claims**



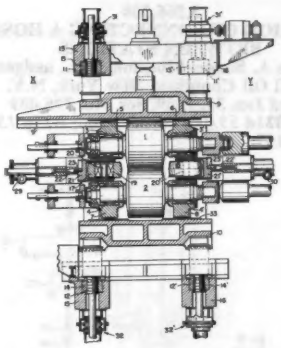
A form tool having an interchangeable insert with a means for accurately aligning the insert in the block and holding it in inserted position.

3,566,497
CONVEYOR ROLLER
Edmund Lorne Hamlen, 39 Lawrence Ave. E., Toronto 12, Ontario, Canada
Filed Aug. 19, 1968, Ser. No. 753,613
Int. Cl. B60b *7/04*
U.S. Cl. 29—123 **1 Claim**



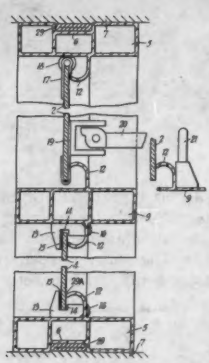
A roller for a belt type conveyor having a corrosion resistant non-magnetic tubular member of fibres bonded with a resin, the tubular member being enclosed by resinous end caps. The roller is rotatably mounted on a shaft supported on a support bracket.

3,566,498
METHOD FOR CHANGING THE ROLLS OF A ROLLING MILL AND APPARATUS FOR APPLYING THE METHOD
Eiichi Kato and Yukio Ohno, Yokohama-shi, Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo-to, Japan
Filed Jan. 14, 1969, Ser. No. 791,029
Claims priority, application Japan, July 8, 1968, 43/48,009
Int. Cl. B23p *11/00, 19/00*
U.S. Cl. 29—148.4 **2 Claims**



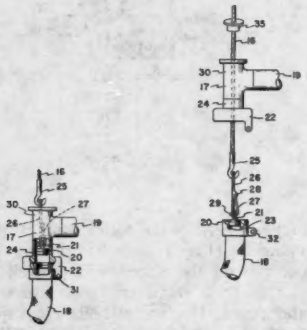
The roll replacement of the rolling mill is made in the following manner: There is attached a cross beam provided with a rail on the upper side as well as on the lower side of the roll stand and each cross beam can move up and down. Horizontal rolls are supported on each of the cross beams. At the time of the roll replacing, the upper cross beam is raised and the lower cross beam is pulled down by means of the screw adjusting device so that the roll replacement can be made with ease in the roll stand. When the vertical rolls are to be replaced at the same time with the horizontal rolls, the vertical rolls are suspended on the chock of the upper horizontal roll or placed on the lower horizontal roll, and a device for pushing in and drawing out is made to engage with the chock for the upper and lower horizontal rolls, and then sets of all rolls can be changed at the same time.

3,566,499
METHOD OF MOUNTING SHEET MATERIAL
Peter Henry James, 9 Adamsrill Road, London, SE. 26, England
Filed Aug. 6, 1968, Ser. No. 750,520
Claims priority, application Great Britain, Aug. 15, 1967, 37,560/67; Nov. 15, 1967, 52,088/67
Int. Cl. B23p *17/00, 11/02, 19/00*
U.S. Cl. 29—155 **11 Claims**



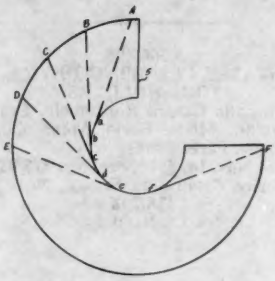
A method of glazing, or mounting other sheet materials, which employs a substantially rigid polyvinyl chloride frame having a projecting resilient rib. The glass or other sheet material is assembled to a coupling member and mechanically pressed or clamped against the free edge of the rib with the aid of the clamping member, the clamping member being secured to the other end of the rib by a bolt. A narrow free edge region of the glass or other sheet material projects beyond the rib.

3,566,500
METHOD OF CONNECTING A HOSE BETWEEN STATIONS
Theodore A. Simon, Houston, Tex., assignor to Shell Oil Company, New York, N.Y.
Filed Jan. 31, 1969, Ser. No. 795,489
Int. Cl. B21d *53/00;* **B21k** *29/00;* **B23p** *15/26*
U.S. Cl. 29—157 **6 Claims**



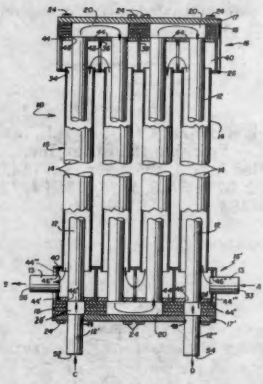
A method of connecting a hose between a pair of stations wherein at least one of the stations is erratically movable with respect to the other and at least one of the stations has a pipe terminating in a pipe T coupled thereto and the other of the stations is connected to the hose. A drawline is extended through the run of the pipe T. One end of the drawline is connected to the free end of the hose and the drawline is pulled through the run of the pipe T to thereby draw the hose into mating contact with the adjacent end of the pipe T. The hose is connected to the adjacent end in a fluid-tight relationship and the drawline is disconnected from the hose. Finally, the drawline is removed from the pipe T and the other end of the run of the pipe T is closed whereby the pipe T establishes fluid communication between the hose and the pipe.

3,566,501
METHOD OF MAKING SPIRAL CHUTE
Donald M. Winchester, 11709 Sahara Way, Dallas, Tex. 75218
Continuation-in-part of application Ser. No. 520,615, Jan. 14, 1966. This application June 3, 1969, Ser. No. 830,084
Int. Cl. B21d *53/00;* **B21k** *29/00*
U.S. Cl. 29—157.3 **4 Claims**



A method of manufacturing a spiral chute slide in which the slide is cut from a flat sheet which is then bent around straight lines tangential to the inner edge contour.

3,566,502
METHOD OF MAKING COUNTERFLOW FLUID CONDENSERS
Piero Pasqualini, Via Antonini 26, Milan, Italy
Filed Feb. 23, 1968, Ser. No. 707,587
Claims priority, application Italy, Mar. 4, 1967, 13,351/67
Int. Cl. B21d *53/02;* **B21k** *29/00*
U.S. Cl. 29—157.3 **10 Claims**



A counterflow fluid condenser which includes a pair of opposite chambered manifold heads and a plurality of telescopically associated pipe pairs connected between said heads to the respective chambers thereof, there being defined one independent path with appropriate inlet and outlet for condensate and another independent path with appropriate inlet and outlet for coolant; the manifold

heads each being formed as elongate U-shaped housing divided into a plurality of chambers by spaced cross-baffles seated therein and supported by respective parallel spaced rib pairs formed along the inner surface of the floor and sides of said housing, a plurality of bridging plates seated on respective ones of bridging ribs likewise formed on the inner surface of the side walls of said housing, the floor of said housing being provided with first perforations of size and configuration to receive therethrough the outer one of said pipe pairs and the bridging plates each being provided with a second perforation for receiving therethrough the inner one of said pipe pairs; said bridging baffles also having means for receiving stud fasteners and suitable washer and cover means being secured to the bridging plates utilizing said stud fasteners; the coolant path traversing said chambers and the condensate path being non-communicating with said chambers. The novel method of making the condenser being characterized by the steps of forming a manifold head sub-assembly by impressing a plurality of grooves in one face of a sheet metal blank at predetermined locations thereon simultaneously forming ribs on the opposite face thereof, bending said grooved blank to an inwardly ribbed, U-shaped configuration to define a floor having sections defined between the rib pairs and opposite equal side walls with the grooves on the exterior thereof, perforating said floor within each section, assembling cross-baffles and bridging plates utilizing said ribs as support therefor so as to define the plurality of manifold chambers, one chamber for each section, engaging respective ones of said pipe pairs through respective ones of said perforations, installing the stud fasteners on the bridging plates and thereafter copper-brazing the thus constructed subassembly in an oven and thereafter applying and securing suitable washers and covers to opposite manifold heads thereafter to complete the counterflow condenser; the coolant and condensate inlets and outlets being provided in one of said manifold heads.

3,566,503

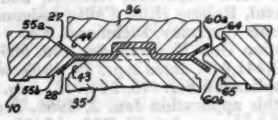
METHOD AND APPARATUS FOR MAKING GROOVED WHEELS

Matthew Pacak, Solon, Ohio, assignor to Eaton Yale & Towne Inc., Cleveland, Ohio

Continuation-in-part of application Ser. No. 538,853, Mar. 30, 1966. This application May 2, 1966, Ser. No. 546,707

Int. Cl. B21d *53/26;* **B21k** *1/28, 1/42*

U.S. Cl. 29—159 **9 Claims**



A method and apparatus for fabricating a grooved member from a disc-shaped metal blank. The method includes rotating the blank, splitting and separating the edge portion of the blank by means of a splitting tool so as to form a pair of flanges separated by a groove, and shaping the groove by means of a groove-forming tool whereby the force applied to the blank by operation of the splitting tool serves to counteract the force applied by operation of the forming tool. The apparatus includes a spindle means for rotating the blank, a splitting tool which operates to split the edge portion of the blank into a pair of flanges and to spread the flanges in order to define a groove, a groove-forming tool which operates to shape the groove, and means whereby the force applied to the blank and spindle means by the forming tool is counteracted by the force applied to the blank by the splitting tool.

3,566,504

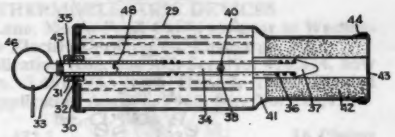
METHOD OF MAKING WIRE GUN

Andrew Grandy, Jr., 2707 Grant Ave., North Hills, Pa. 19038

Original application Mar. 15, 1962, Ser. No. 180,058, now Patent No. 3,470,861, dated Oct. 7, 1969. Divided and this application Mar. 28, 1969, Ser. No. 823,232

Int. Cl. B21f *35/00;* **B23p** *13/00*

U.S. Cl. 29—173 **6 Claims**



Hand held gun from which wire is ejected for entanglement of enemy personnel, laying communication wires over inaccessible terrain, and the like. The wire is initially twisted in one direction to place a torsional stress thereon. It is then heated and quenched to provide a permanent set to the wire which is then twisted in an opposite direction to place another torsional stress thereon which supplies the force necessary for ejecting it from the gun.

3,566,505

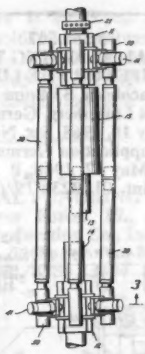
APPARATUS FOR ALIGNING TWO SECTIONS OF PIPE

Charles F. Martin, Houston, Tex., assignor to HydroTech Services, Inc., Houston, Tex.

Filed June 9, 1969, Ser. No. 831,576

Int. Cl. B23p *19/00*

U.S. Cl. 29—200 **17 Claims**



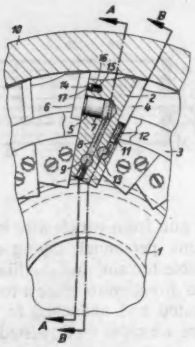
An apparatus for axially aligning two sections of pipe, as for example two sections of a severed pipeline located at a remote location, such as under water. It includes a pair of axially spaced apart clamps, each of which is arranged for clamping about a length of one of the sections of pipe. It includes a plurality of connecting members connected between the clamps. Abutment means are interposed between the ends of the connecting members and the clamps for holding the clamps and members in predetermined relationships wherein the clamps are axially aligned. It also includes means for moving the connecting members to said relationships whereby the sections of pipe are thereby axially aligned. The apparatus may also be used to hold two sections of pipe during the joinder thereof as by welding.

3,566,506

CUTTER-EQUIPPED MILLING TOOL AND DEVICE FOR ADJUSTING AND TENSIONING THE CUTTERS OF MILLING TOOLS

Adolf Wolf, Jes-Juhl-Weg 9, Hamburg 52, Germany

Filed Jan. 24, 1968, Ser. No. 700,109
Int. Cl. B23p *19/00;* B26d *1/12*
U.S. Cl. 29—200 **11 Claims**



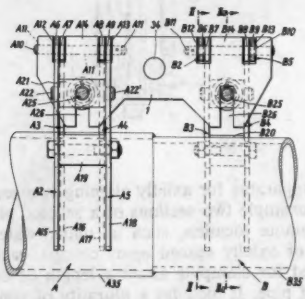
A system for manufacturing and assembling milling tools wherein the tool includes a base member having a plurality of individual cutting elements mounted thereon. The cutting elements are both radially adjusted, and clamped to the base member by hydraulic fluid pressure devices, and, during assembling of the cutters to the base member, a centering ring is mounted upon the base member in a concentric manner wherein the radial adjustment of the cutters is determined by engagement with the centering ring. In an embodiment of the invention communication exists between each of the radially adjusting and clamping elements, respectively, whereby simultaneous operation thereof may be produced.

3,566,507

EXTERNAL ALIGNING TOOL FOR PIPES OR THE LIKE

Helmuth H. Jacobsen, 53 Bonn 1, P.O. Box 88, Post Luftelberg, Germany

Filed July 10, 1968, Ser. No. 743,656
Claims priority, application Germany, July 11, 1967, R 46,449; May 17, 1968, P 17 52 385.2
Int. Cl. B23p *19/00*
U.S. Cl. 29—200 **30 Claims**



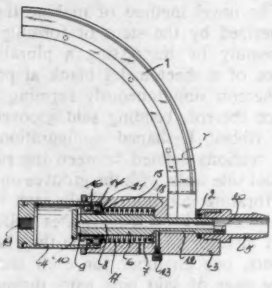
An external aligning tool for tubes, rods or like workpieces comprises a rigid or deformable carrier which supports several clamping units each of which comprises one or more pairs of arms movable toward and away from each other about a pivot axis defined by the carrier. The arms have beaked clamping portions movable into or away from engagement with a workpiece which is placed between the arms of the respective clamping unit. The drive means for pivoting the arms can include a separate drive for each pair of arms or a single drive which can move all of the arms simultaneously or seriatim. The carrier can comprise two pivotally and longitudinally adjustably connected portions each of which carries a clamping unit.

3,566,508

DEVICE FOR APPLYING PLUGS, BUTTONS OR THE LIKE TO VALVES FOR AEROSOL CONTAINERS

Tomaso Ruscitti, 11 Via Amedeo d'Aosta, Milan, Italy

Filed July 30, 1968, Ser. No. 748,708
Claims priority, application Italy, Aug. 31, 1967, 19,995/67
Int. Cl. B23p *19/04;* B23g *7/10*
U.S. Cl. 29—208 **7 Claims**



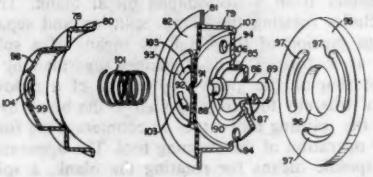
A device for applying plugs, buttons and the like to valves of aerosol containers. A pneumatically operated unit feeds the buttons one at a time to a centering head which is also pneumatically operated. A conveyor system feeds the aerosol containers successively to a location beneath the pneumatically operated centering head. In response to location of an aerosol container beneath the centering head, the structure automatically delivers a button to the centering head which then pneumatically assembles the button with the valve of the aerosol container. The thus-treated container is then moved away from the centering head, and the next container is situated therebeneath to have the next button assembled with the valve thereof.

3,566,509

METHOD OF ADJUSTING A PRESSURE REGULATOR CONSTRUCTION

Michael John Caparone, Arcadia, and Theodore John Dykzeul, Rolling Hills, Calif., assignors to Robertshaw Controls Company, Richmond, Va.

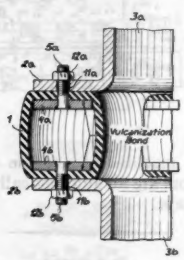
Application Oct. 22, 1965, Ser. No. 509,675, now Patent No. 3,441,049, dated Apr. 29, 1969, which is a division of application Ser. No. 214,903, Aug. 6, 1962. Divided and this application Jan. 2, 1969, Ser. No. 800,318
Int. Cl. B23q *17/00*
U.S. Cl. 29—407 **6 Claims**



This disclosure relates to a self-contained pressure regulator that can be readily disposed in a housing means against a surface thereof having an inlet and an outlet respectively disposed in fluid communication with an inlet means and an outlet means of a pressure regulator, the pressure regulator comprising a cup-shaped casing having its closed end provided with its inlet means and

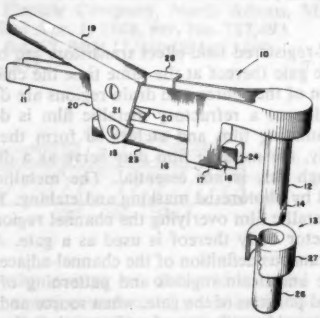
outlet means and having its opened end turned over to secure a flexible diaphragm thereto that cooperates with the casing to define a chamber that is in fluid communication with the inlet means and outlet means thereof while carrying a valve member that controls the inlet means thereof.

3,566,510
METHOD OF MAKING EXPANSION JOINT FOR FLUID CONDUITS
Alfred Wendt, Oberhausen, Germany, assignor to Kempchen & Co. G.m.b.H., Oberhausen Rhineland, Germany
Filed Jan. 29, 1969, Ser. No. 794,852
Claims priority, application Germany, Feb. 1, 1968, P 16 75 329.0
Int. Cl. B23p *17/00*
U.S. Cl. 29—423 **5 Claims**



An expansion joint interconnecting a pair of flanged pipes comprises a toroidal compensator tube of fluid-impermeable elastic material enclosing two metallic rings which are substantially coextensive with the adjoining pipe flanges and are fastened thereto in a fluidtight manner by screws traversing the tube wall. To dispose the two metal rings inside the compensator tube, the rings are coaxially placed on opposite sides of a toroidal body of sand or other flowable bulk material held in position by a tubular liner of fabric or the like which is then enshrouded in a sheath of elastomeric material molded therearound; holes are thereafter formed in the elastomeric sheath and the liner to accommodate fastening screws engaging the rings, whereupon the bulk material is discharged from the interior of the compensator tube through some of these holes prior to insertion of the screws. The rings are advantageously bonded, preferably by vulcanization, to the inner tube wall.

3,566,511
ELECTRICAL WRENCH
Harold J. Wilson, 14–10 141st St., Whitestone, N.Y. 11357
Filed Mar. 17, 1969, Ser. No. 818,164
Int. Cl. B25b *7/04, 7/12*
U.S. Cl. 29—428 **11 Claims**

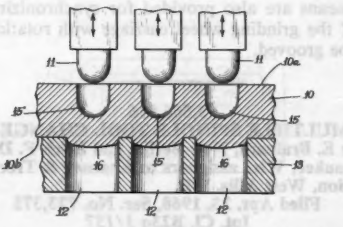


An electrical wrench for tightening nuts, having peripheral ribs, within a switch box. The wrench is adapted to fit within the switch box and has a lever actuated pawl for engaging the ribs of the nut. A ratchet-like motion within a limited arc will cause the pawl to alternately contact the ribs and thereby cause the nut to be tightened. An interchanegable socket is utilized to position the wrench and the pawl relative to the nut.

3,566,512
THERMOELECTRIC DEVICES
Donald H. Lane, Menlo Park, Calif., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Original application Aug. 9, 1965, Ser. No. 478,274, now Patent No. 3,481,795, dated Dec. 2, 1969. Divided and this application Apr. 25, 1968, Ser. No. 724,018
Int. Cl. B23k *31/02*
U.S. Cl. 29—472.1 **16 Claims**

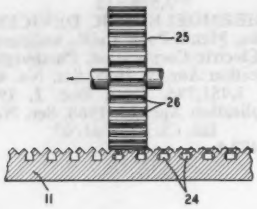
A self-spacing solder is employed to facilitate the formation of a sound solder joint between electrical contacts and electrical leads affixed to bodies of thermoelectric material. A preferred self-spacing solder comprises a tin-phosphorus alloy having insoluble iron particles admixed therein.

3,566,513
METAL PUNCHING
Judson E. Fuller, River Forest, Ill., assignor to The Harrington & King Perforating Co., Inc., Chicago, Ill.
Filed Mar. 5, 1969, Ser. No. 804,390
Int. Cl. B23p *13/04*
U.S. Cl. 29—557 **4 Claims**



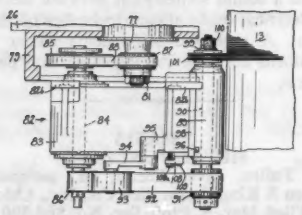
A punch produces an indentation in the metal with some of the metal being displaced outwardly on the opposite side. This displaced metal is removed and a punch is inserted into the indentation and forced through the metal.

3,566,514
MANUFACTURING METHOD FOR BOILING SURFACES
Edward T. Szumigala, Cheektowaga, N.Y., assignor to Union Carbide Corporation
Filed May 1, 1968, Ser. No. 725,789
Int. Cl. B23p *13/04*
U.S. Cl. 29—558 **8 Claims**



A boiling surface layer is formed from a thermally conductive wall by first cutting deep parallel grooves with metal removal, then cutting shallower grooves parallel to and between the first grooves, and then knurling to provide subsurface cavities with restricted openings to the outer surface.

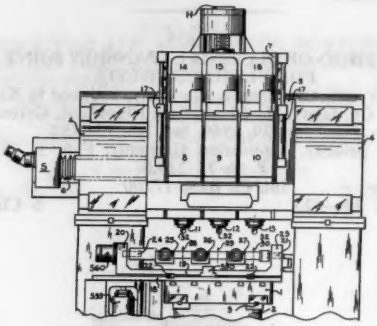
3,566,515
ROLL GRINDING MACHINE
Gunnar V. Hultgren, Milford, Alvin J. Zikaras, Trumbull, and Donald J. Costello, Seymour, Conn., assignors to Farrel Corporation, Ansonia, Conn.
Filed Mar. 8, 1968, Ser. No. 711,591
Int. Cl. B26d *3/06*; B24b *5/06*
U.S. Cl. 29—560 **6 Claims**



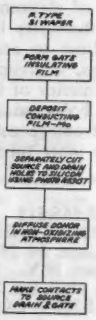
A grinding machine provided with a detachable assembly for substituting a grooving cutter for a grinding wheel and driving the cutter from the grinding wheel spindle. Drive means are also provided for synchronizing movement of the grinding wheel carriage with rotation of the roll to be grooved.

3,566,516
MULTIPLE SPINDLE TOOL CHANGER
Wallace E. Brainard, New Berlin, and Erich F. Drechsler, Milwaukee, Wis., assignors to Kearney & Trecker Corporation, West Allis, Wis.
Filed Apr. 23, 1968, Ser. No. 723,372
Int. Cl. B23q *3/157*
U.S. Cl. 29—568 **8 Claims**

The disclosure relates to a multiple spindle profiler for producing a plurality of milling operations simultaneously on the same or identical workpieces and includes keylock mechanisms for a positive drive between the cutters and the spindles with orienting mechanism to stop the spindles in a particular position to cooperate with tools brought to the spindles by a tool change mechanism. The tool change mechanism is adapted to change the tools that have been used for tools that are going to be used, and the machine as a whole as well as the tool changing operation, are all automatically carried out under the control of a tape.



3,566,517
SELF-REGISTERED IG-FET DEVICES AND METHOD OF MAKING SAME
Dale M. Brown, Schenectady, and William E. Engeler, Peter V. Gray, and Marvin Garfinkel, Scotia, N.Y., assignors to General Electric Company
Filed Oct. 13, 1967, Ser. No. 675,228
Int. Cl. B01j *17/00*; H01g *13/00*
U.S. Cl. 29—571 **11 Claims**


N TYPE Si WAFER
FORM GATE INSULATING FILM
DEPOSIT CONDUCTING FILM—Pro
SEPARATELY CUT SOURCE AND DRAIN HOLES TO SILICON USING PHOTO RESIST
DIFFUSE DONOR IN NON-OXIDIZING ATMOSPHERE
MAKE CONTACTS TO SOURCE DRAIN & GATE

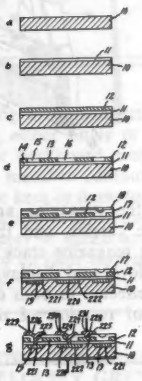
Self-registered field-effect transistors are built by forming the gate thereof at the same time the channel-adjacent portion of the source and drain regions are defined. In one embodiment a refractory metallic film is deposited over an insulating film and etched to form the gate. Subsequently, the metallic film may serve as a diffusion mask, although this is not essential. The metallic film is patterned by photoresist masking and etching. The portion of the metallic film overlying the channel region of the semiconductor body thereof is used as a gate. As a result of simultaneous definition of the channel-adjacent portions of source and drain regions and patterning of the channel-aligned portions of the gate, when source and drain regions are formed by diffusion of activators into the silicon wafer, automatic registration of the gate-adjacent portions of the source and drain junctions beneath the gate is achieved.

3,566,518

METHOD FOR FABRICATING FIELD-EFFECT TRANSISTOR DEVICES AND INTEGRATED CIRCUIT MODULES CONTAINING THE SAME BY SELECTIVE DIFFUSION OF ACTIVATOR IMPURITIES THROUGH PRESELECTED PORTIONS OF PASSIVATING-INSULATING FILMS

Dale M. Brown, Schenectady, and William E. Engeler, Scotia, N.Y., assignors to General Electric Company

Filed Oct. 13, 1967, Ser. No. 679,957
Int. Cl. B01j 17/00; H01g 13/00
U.S. Cl. 29—571 18 Claims



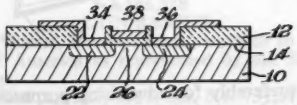
Improved semiconductor field-effect transistors have self-registration and electrical insulation. Conductivity-modified, surface-adjacent source and drain regions are formed by diffusing dopants through gate-oxide layer. One embodiment features a conducting gate electrode which is formed from a thin deposited film. In this embodiment a large region of opposite-conductivity-type semiconductor is formed by diffusion through both conducting and oxide films. Complementary "N-channel" and "P-channel" devices may be formed on the same substrate by combining two separate embodiments. In such devices the original conductivity-type semiconductor is the base for one FET, while the large conductivity-modified type region is the base for the other FET. Such modules may be interconnected to form integrated circuits capable of performing a variety of logical functions.

3,566,519

METHOD OF MAKING FIELD EFFECT TRANSISTOR DEVICE

Jerome F. Lapham, Jr., Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Apr. 1, 1968, Ser. No. 717,493
Int. Cl. B01j 17/00; H01g 13/00
U.S. Cl. 29—571 7 Claims



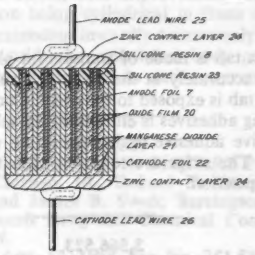
A high purity coating of dielectric material is first formed over a major surface of a semiconductive body of one conductivity type. The coating is then purified by removal of a thin layer of its outer surface, and spaced apart regions of the other conductivity type are diffused within the body adjacent its major surface. The coating is again purified by removal of a thin outer layer, and the thickness of coating is reduced in an area overlying the channel formed by the separation between regions so as to provide a gate insulation of high purity without exposure of junctions.

3,566,520

METHOD OF MANUFACTURING SOLID ELECTROLYTIC CAPACITORS

Takeshi Namikata and Katsutoshi Yamaguchi, Kawasaki-shi, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 2, 1968, Ser. No. 726,123
Int. Cl. B01j 17/00; H01g 9/00
U.S. Cl. 29—570 7 Claims



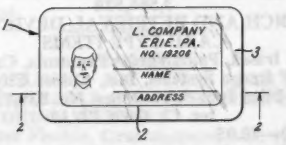
A solid electrolytic capacitor is manufactured by coating a longitudinally extending area at one edge of an aluminum anode foil on both surfaces thereof with heat-resistant electrically insulating material of silicone resin. Both surfaces of an aluminum cathode foil are coated with a lacquer of cellulose derivative. The anode foil and the cathode foil are overlapped with part of the coated area of the anode foil extending beyond the edge of the cathode foil and the foils of the body are wound. The wound body is reformed and the lacquer is decomposed and removed from the cathode foil. The end faces of the wound body are covered with heat-resistant insulation of silicone resin. Lead wires are affixed to the end faces of the wound body by removing the insulation covering such faces, applying zinc to such faces and soldering the lead wires to the zinc.

3,566,521

TAMPER PROOF INFORMATION BEARING CARD

Lawrence A. Conner, 137 Skyline Drive, Glen Mills, Pa. 19342

Filed Sept. 29, 1967, Ser. No. 671,867
Int. Cl. G09f 3/02
U.S. Cl. 40—2.2 4 Claims

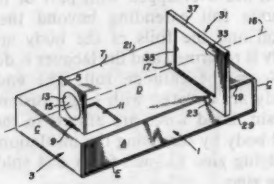


This invention relates to the protection against unwanted or unauthorized alterations of information by the utilization of photography. Particularly, this invention utilizes a photographic transparency in a heat-and-pressure laminated structure, which transparency is designed to become defaced if the lamination is opened in any way.

3,566,522
INDEX TABS
Thomas A. Leach, Mount Prospect, Joseph E. Kohnke, Arlington Heights, and Vernon J. Wiberg, Des Plaines, Ill., assignors to G. J. Aigner Company, Chicago, Ill.
Filed Jan. 28, 1969, Ser. No. 794,620
Int. Cl. G09f 3/16
U.S. Cl. 40—23 7 Claims

An index tab is made of transparent plastic and can be positioned accurately at the edge of a sheet before adhesive of the tab is exposed to the sheet. Conventional use of moisturizing adhesives is eliminated by substituting a pressure sensitive adhesive and cooperating adherent protective strips. The strips are removed after the tab has been located in position.

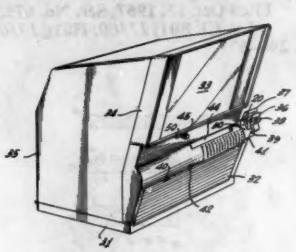
3,566,523
COMBINATION PHOTOGRAPHIC IMAGE CONTAINER AND VIEWER
George R. Bower, Holley, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed July 29, 1968, Ser. No. 748,439
Int. Cl. G09f 11/30
U.S. Cl. 40—63 5 Claims



A mailing and storage container for use by film processors for delivering photographic images to customers has a lens and a slot which adapt the container for use as a viewer of the images. A photographic image is supported in the slot and then viewed through the lens.

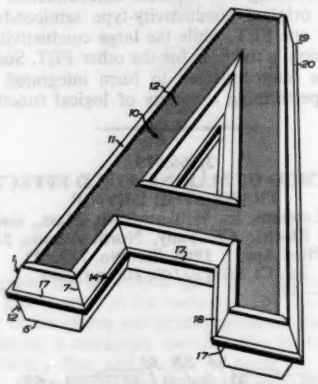
3,566,524
SEARCH AND RETRIEVAL DEVICE FOR CARD-TYPE ITEMS
Eugene H. Irasek, Palos Verdes Peninsula, Calif., assignor to HF Image Systems, Inc., Culver City, Calif.
Filed June 5, 1969, Ser. No. 830,771
Int. Cl. G09f 11/30
U.S. Cl. 40—78.05 33 Claims

A search, retrieval and display device for card-type items such as microfiche located in a horizontal stack magazine. The magazine with the items therein is moved through the device with an air blast directed side to side through the items to separate them individually. A riffling member rotates at right angles to the items and has spaced peripheral gate notches therein receiving the upper edges of the cards to separate them individually by a substantial space therebetween. The desired card in the magazine may be identified optically by indicia or other identification, and carrier means is provided for entering the magazine stack, picking up a desired microfiche or other card, and moving it in X and Y directions into an optical path which displays the desired image on the item onto a screen. After viewing, the item is returned to the



same place within the magazine and is automatically disengaged from the carrier, and the device is set up for again riffling the magazine stack to identify another item desired for retrieval and display. Riffling and magazine movement are effected in both directions depending upon the direction of rotation of the operating mechanism.

3,566,525
ADVERTISING SIGN
Bertil P. Nassil, Johannesgatan 22, Stockholm, Sweden, and Bror A. Hakansson, Ankdammsgatan 28, Solna, Sweden
Continuation of application Ser. No. 618,401, Feb. 24, 1967. This application Dec. 1, 1969, Ser. No. 876,213
Claims priority, application Sweden, Feb. 28, 1966, 2,615/66
Int. Cl. G09f 13/06
U.S. Cl. 40—130 6 Claims

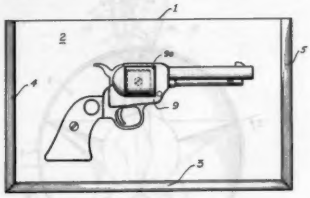


A sign, preferably for advertising purposes, having an opaque box-shaped hollow body, a source of light mounted therein, and at least on one face to be viewed transparent portions to be penetrated by light from the source of light in the form of projections, beads or ribs arranged so as to make the contours or boundaries of the advertised object stand out from the surrounding sign surface and shine in the dark.

3,566,526
DISPLAY CASE WITH MAGNETIC HOLDING MEANS

Paul A. La Violette, North Haven, Conn., assignor to Colt's Inc., Hartford, Conn.

Filed Jan. 6, 1969, Ser. No. 789,135
Int. Cl. G09f *1/12*
U.S. Cl. 40—160 6 Claims

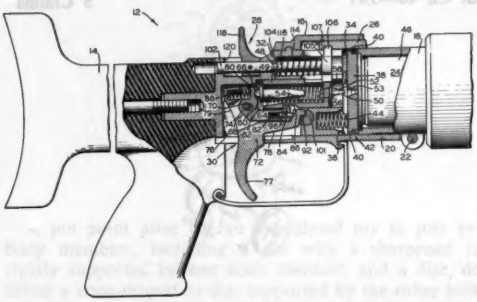


A device, including a box-like structure, for displaying a variety of objects, either singly or plurally, said device having a support or backboard member to which is attached a magnetic member contoured to receive a selective portion of the item or items to be displayed to magnetically support each item in a spaced apart relation to the face of the support or backboard member to thereby create the illusion of an item suspended in space without visible means of support.

3,566,527
EMERGENCY FIREARM FIRING MECHANISM FOR HIGH VELOCITY GRENADE ROUNDS

Stanley D. Silsby, Granby, Mass., assignor to the United States of America as represented by the Secretary of the Army

Filed Dec. 6, 1968, Ser. No. 781,738
Int. Cl. F41c *11/00, 11/02*
U.S. Cl. 42—41 7 Claims



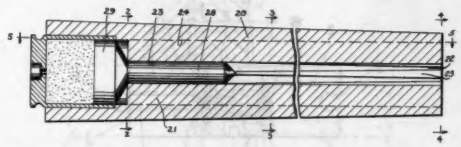
For firearms having a hinged barrel, a firing mechanism including a pressure plate actuatable by the cartridge case set back for automatically cocking the firing pin by cartridge discharge and a barrel latching device engageable with the firing pin for retraction thereof to assure cocking when the barrel is unlatched for loading.

3,566,528
GUN BARREL

C Walton Musser, Beverly, Mass., assignor to the United States of America as represented by the Secretary of the Army

Filed Apr. 23, 1958, Ser. No. 731,078
Int. Cl. F41c *21/00*; F42b *11/00, 15/00*
U.S. Cl. 42—78 3 Claims

1. In a gun barrel of the type having a chamber for receiving a projectile having a body portion and an enlarged somewhat conical base, lands and grooves in the gun barrel extending from said chamber for receiving said enlarged base to the muzzle of said gun barrel, and the grooves being tapered in width from a maximum width at said chamber for said conical base to a minimum width adjacent said muzzle whereby said enlarged base of a projectile may be formed into upstanding fins as said projectile is moved through said gun barrel toward the muzzle, the combination therewith of the improvement to reduce balloting or wobble of the projectile in

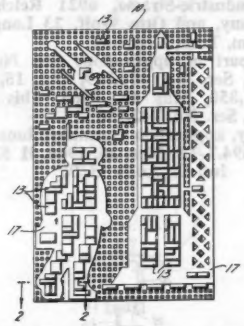


the gun barrel and enhance accuracy in its flight after leaving the gun barrel, said improvement including the said body portion being cylindrical in front of said fins and said lands extending inwardly transversely of the gun to contact and guide the cylindrical body portion of a projectile during substantially its entire movement within the gun barrel.

3,566,529
MOSAIC PLUG-IN TOY AND PICTURE PATTERNS

Albert Kner, Chicago, Ill., Roland T. Schorer, Smoke Rise, N.J., and James B. Swett, Barrington, R.I., assignors to Rexall Drug and Chemical Company, Los Angeles, Calif.

Filed Aug. 12, 1968, Ser. No. 751,814
Int. Cl. A63h *33/08*
U.S. Cl. 46—17 2 Claims



A mosaic plug-in toy having a grid type base member and a plurality of mosaic tiles adapted to be plugged into the base member, and having a sheet of material adapted to form outlines on the grid portion which forms, with the individual tile units, the completed design. The outline sheet is held to the grid by the tiles. The package for the toy is provided by a box having a base member which serves as a decorative picture frame for the completed mosaic design.

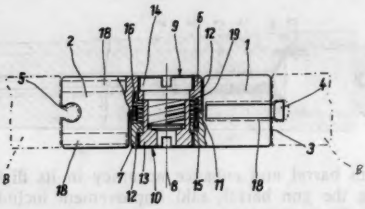
3,566,530
TOY BUILDING KIT WITH ANGULARLY DISPLACEABLE COUPLING MEANS WITH RESTORING MEANS

Artur Fischer, Gruenmettstetterstr. 133, Tumlingen, Germany

Filed Sept. 30, 1968, Ser. No. 763,551
Claims priority, application Germany, Sept. 30, 1967, F 53,639
Int. Cl. A63h *33/08*
U.S. Cl. 46—23 9 Claims

A toy building kit includes at least two building blocks each of which is provided with at least one undercut connecting portion. A coupling arrangement is provided

for coupling the toy building blocks to one another with freedom of relative angular displacement. It includes two coupling sections, each of which is provided with at least one connecting portion which can mate with an undercut connecting portion of one of the toy building blocks and a joint which joins the coupling sections to one another so that they have freedom of relative angular



displacement from a rest position to a displaced position whereby building blocks connected to the respective sections are similarly angularly displaced. Displacing means is associated with the sections and is operative for restoring the same to the aforementioned rest position when they undergo angular displacement from the rest position to a displaced position and the force effecting such angular displacement is terminated.

3,566,531

MATING BLOCKS HAVING BEADED STUDS AND RESILIENT SIDEWALLS

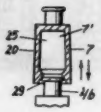
Heinz Hasel, Industrie-Strasse, 6921 Reichartshausen, Baden, Germany, and Otto Wolf, 23 Lange Morgen, 7312 Kirchheim, Teck, Germany

Continuation-in-part of applications Ser. No. 284,992, June 3, 1963, Ser. No. 404,009, Oct. 15, 1964, and Ser. No. 557,850, May 13, 1966. This application Feb. 15, 1968, Ser. No. 742,986

Claims priority, application Germany, June 9, 1962, P 12 02 694.7–15; Mar. 25, 1964, H 52,160

Int. Cl. A63h *33/08*

U.S. Cl. 46—25 **14 Claims**



Hollow, box-like toy blocks open on the lower side and having studs on the upper side to mate with the open side. The studs may have beads and there are resilient side walls forming the opening, the edges of which may have notches to receive the beads. Sawtooth projections may be provided on said edges, to be cammed aside by the beaded studs. The blocks may have interior partition walls and different walls of a block may vary in flexibility. The studs may be hollow and the walls apertured to allow other elements to pass into the block interior.

3,566,532

FLYING SAUCER TYPE TOY

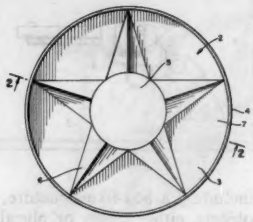
Henry Allen Wilson, 4630 Leona St., Tampa, Fla. 33609

Filed Nov. 8, 1967, Ser. No. 681,429

Int. Cl. A63k *27/12*

U.S. Cl. 46—74 **5 Claims**

A two sided flying saucer toy which is preferably made of a moldable synthetic plastic material, the toy being constructed with a relatively thin walled central hollow body portion from which hollow design forming wall portions radiate to the handle-like rim of the saucer. The web portions of the disc-like saucer intermediate the hollow radial design forming portions being functionally integral and relatively thickened to provide sufficient transverse strength to allow repeated use of the device with the light weight relatively large design forming wall portions. The handle rim is of cylindrical hoop-shape and extends in opposite



directions from the central disc portion of the toy out and beyond the raised design carried thereon so as to protect the same when thrown and on alighting and to provide a hand gripping rim to permit an average child to obtain a good throwing grip from any peripheral point thereon to spin and hurl the disc in a straight line with improved throwing accuracy.

3,566,533

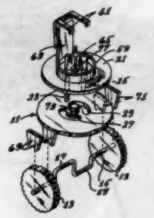
WHEELED TOY

Ralph Dunn, Manhattan Beach, Armando P. Villasana, Los Angeles, and Stephen W. Piurkowsky, Torranco, Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 23, 1969, Ser. No. 793,251

Int. Cl. A63h *11/10*

U.S. Cl. 46—107 **5 Claims**



This is a toy vehicle that has a pivotally mounted platform that may support a toy figure or doll. The toy includes traction wheels connected to an axle having a pair of oppositely disposed crank portions that alternately move different ones of two depending members attached to the platform to cause the platform and any doll that it supports to turn from side to side as the vehicle is moved over a surface.

3,566,534

PIVOTABLE DOLL LEG

Gunter E. Becker, 17213 Yukon Ave., Apt. H, Torrence, Calif. 90503

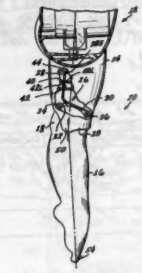
Filed July 31, 1969, Ser. No. 846,462

Int. Cl. A63h *3/46*

U.S. Cl. 46—163 **9 Claims**

A doll leg which pivots at the knee between two orientations, and which retains either of the orientations. The leg includes an upper leg member, a lower leg member pivotally joined to the upper member, a protuberance at

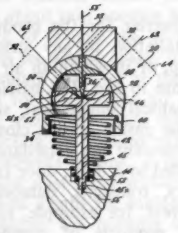
the top of the lower member, and a leaf spring having an inner end mounted on the upper leg member and an outer end portion extending tangential to the path taken by the protuberance as it moves when the lower leg member pivots.



3,566,535
LOOK-ALIVE DOLL PIVOT JOINT

Elliot Handler and John W. Ryan, Los Angeles, Jurgis Sapkus, Manhattan Beach, and Wallace H. Shapero, Torrance, Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Oct. 3, 1968, Ser. No. 764,669
Int. Cl. A63h *3/20*
U.S. Cl. 46—161 **13 Claims**



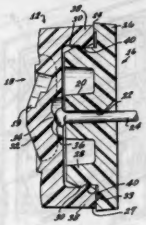
A pin point joint for an articulated toy to join two body members, including a pin with a sharpened tip rigidly supported by one body member, and a disc, defining a cone-shaped cavity, supported by the other body member. A torsion spring, connected to the two body members, spring biases the pin into the cavity with the pin's tip in engagement with the cone's vertex. The torsion spring is used to provide pivotal and/or rotational restoring forces to the first member, to reposition it in its quiescent position, after its position is disturbed by force applied by a playing child.

3,566,536
TOY VEHICLE WHEELS

William R. Baynes, Palos Verdes Peninsula, and Keith M. Johnson, South Laguna, Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed July 9, 1969, Ser. No. 840,206
Int. Cl. A63h *17/26*
U.S. Cl. 46—221 **10 Claims**

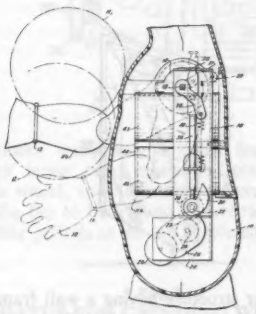
A wheel assembly for a toy vehicle comprising inner and outer wheel elements that can be snapped together over the end of an axle. The inner wheel element includes a bearing hole at the center for receiving the axle, an axially-extending flange near the rim, and a tread portion at the rim for rollably supporting the vehicle on a track. The outer wheel element has a flange that snaps over the flange of the inner wheel element to hold them together.



3,566,537
MISSILE-TOSSING TOY

Sidney Tepper, Millburn, and Thomas J. Fauls, West Orange, N.J., assignors to Topper Corporation

Filed Aug. 15, 1969, Ser. No. 850,401
Int. Cl. A63h *33/26*
U.S. Cl. 46—247 **10 Claims**



The toy includes a body carrying a pair of appendages and a switch. The switch may comprise an electrical contact member carried by each appendage. A missile thrown to the toy closes the switch, e.g., the missile may be electrically conductive to bridge the contact members, thereby completing an electrical circuit which moves the appendages from their initial position to an intermediate position. A spring is tensioned during this movement, the tension being released suddenly causing the appendages to snap back to their initial position and toss the missile.

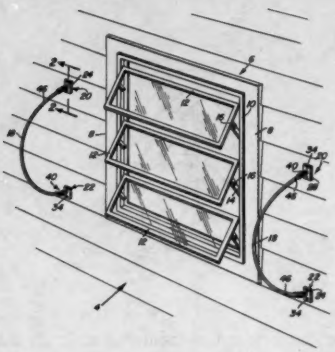
3,566,538
WINDOW SAFETY GUARD

Joseph S. McCallum, Venice, Fla. (1736 Southpointe Drive, Sarasota, Fla. 33581)

Filed Apr. 25, 1969, Ser. No. 819,277
Int. Cl. E06b *9/00*
U.S. Cl. 49—50 **6 Claims**

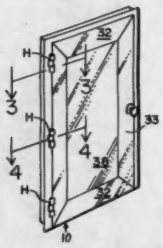
For use adjacent to and parallel with the vertical members of a built-in awning-type window structure, a pair of safety-promoting accident minimizing pedestrian wall supported warning guards. These guards lend themselves to injury preventing use when properly paired and mounted. They project beyond the wall and partially

bridge the path of approach when the windows are open. They are yieldingly mounted and warn passers-by and



minimize the likelihood of colliding with dangerously projecting windows.

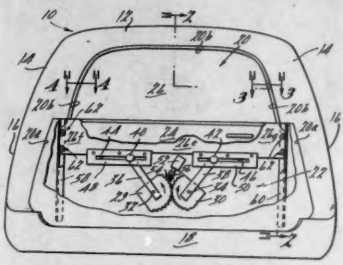
3,566,539
PREHUNG DOOR STRUCTURE
Herb B. Ridgley, 6500 SW. 111th St., Miami, Fla. 33156
Filed July 7, 1969, Ser. No. 839,601
Int. Cl. E06b *3/32*
U.S. Cl. 49—380 **1 Claim**



A prehung door structure having a wall frame, a door frame and hinges mounting the door frame to the wall frame, the door frame, wall frames and the hinges being extruded. The wall frame having a plurality of openings for receiving the leg portion of wall hinge sections and fastening the leg portions to the inner surface of the wall frame, while the door frame and door hinge sections are provided with interlocking members permitting the sliding of the door hinge sections and fastened into position.

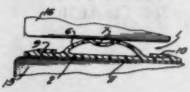
3,566,540
VEHICULAR DOOR GLASS STABILIZING MECHANISM
Keith A. Hewitt, Highland, Mich., assignor to Chrysler Corporation, Highland Park, Mich.
Filed Aug. 15, 1969, Ser. No. 850,428
Int. Cl. E05d *15/16*
U.S. Cl. 49—417 **17 Claims**

A stabilizer mechanism for the tailgate window glass of a station wagon type motor vehicle wherein the side edges of the glass are slideably received in channel members positioned vertically within the door and coacting wedge assemblies positioned in the lateral spaces between the window glass and the channel members, are arranged to be expanded by a spring to a thickness to fill these lateral spaces in any static position of the door and to undergo a contraction in their thickness in response to movement of the glass in either direction to thereby ease the glass movement; each wedge assembly comprises a first wedge piece secured to the glass and a second wedge piece mounted on the first piece for limited vertically slid-



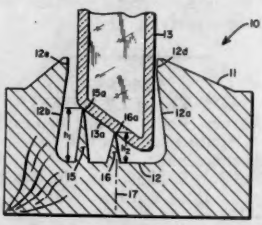
ing movement on that piece to selectively increase or decrease the combined thickness of the two pieces and thereby either stabilize or free up the glass.

3,566,541
PROTECTIVE BARRIER FOR PRODUCTS OF COMBUSTION
Gordon L. Coulter, Arlington Heights, Ill., assignor to Rixson, Inc., Franklin Park, Ill.
Filed Mar. 6, 1969, Ser. No. 804,816
Int. Cl. E06b *7/23*
U.S. Cl. 49—475 **26 Claims**



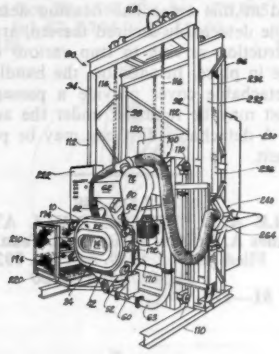
A protective barrier for the products of combustion adapted for installation in any structural environment having an air gap, or in which an air gap will be readily created in response to fire. The barrier features in combination a mechanical smoke seal, such as a soft compressible neoprene gasket, and a closely associated strip or mass of intumescent fire retardant coating. This barrier may be applied to a door, door frame and threshold, windows, louvers, transoms, dampers, containers, and smoke hatch covers, for example, to prevent the ready passage of the products of combustion, particularly smoke, through any structural gaps.

3,566,542
WINDOW ASSEMBLY
Theodore M. Gillen, Stillwater, and Albert O. Dahl, Bayport, Minn., assignors to Andersen Corporation, Bayport, Minn.
Filed Apr. 2, 1969, Ser. No. 822,795
Int. Cl. E06b *7/16*
U.S. Cl. 49—504 **11 Claims**



A window assembly having deformable means for aligning and supporting a window having an inclined marginal edge.

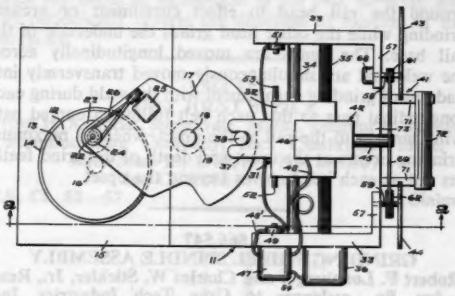
3,566,543
MACHINE FOR TREATMENT OF LARGE VERTICAL SURFACES
James W. Fogle, Walkerton, Ind., assignor to The Wheelabrator Corporation, Mishawaka, Ind.
Filed Feb. 6, 1968, Ser. No. 703,397
Int. Cl. B24c *3/00*
U.S. Cl. 51—9 **18 Claims**



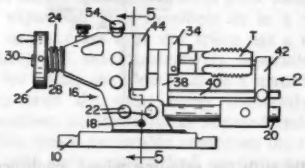
A machine and method for treatment of vertically disposed surfaces of large dimension with dry particulate material comprising means for throwing the dry particulate material at high velocity in the direction toward said surface, a housing enclosing said throwing means having an opening through which the particulate material is thrown against said surface, means for establishing a sealing relationship about said opening between the housing and said surface to confine the particulate material, dirt and dusts within the sealed space, means for collecting the spent particulate material at the bottom portion of the housing and for introducing air into the housing for air washing the spent particulate material to remove dirt and dusts, recycling the washed particulate material for feed to the throwing means, a dust collector for receiving the dirt and dust from within the housing for separation thereof and means for maintaining subatmospheric conditions within the housing to guide the air flow through the housing and about said sealing means to minimize the exhaust of dirt and dust into the atmosphere and in which the support means for said housing includes means for movement of the housing in the vertical direction, means for movement of the housing in the horizontal direction and means for movement of the housing in the direction toward and away from the surface and means for mounting the housing for rocking movement about its pitch and yaw axes to adjust the housing with change in contour of the surface, and sensing means about the opening automatically to adjust the housing for change in contour about the pitch axis and/or the yaw axis and for movement of the housing in the direction toward and away from the surface and for shutting off the feed of particulate material in the absence of a sealing relationship between the housing and surface.

3,566,544
OPTICAL SURFACE GENERATING METHOD AND APPARATUS
Ronald Aspden, Bedford, Mass., assignor to Itek Corporation, Lexington, Mass.
Filed Apr. 25, 1968, Ser. No. 724,082
Int. Cl. B24b *7/24, 1/00*
U.S. Cl. 51—55 **33 Claims**

A surface generating system wherein an optical lap is moved over the surface of an optical blank in a path having both circumferential and oscillating radial components. Continuous and selective variations in the amplitude of the radial component produces a desired radially symmetrical contour on the work surface.

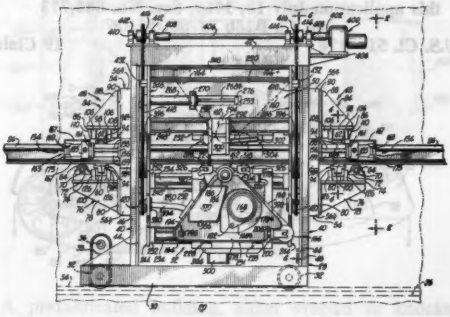


3,566,545
TAP GRINDER
Charles F. Gasek, North Grafton, Mass., assignor to R & A Machine Co., Inc., Worcester, Mass.
Filed Dec. 23, 1968, Ser. No. 786,295
Int. Cl. B24b *3/18, 47/02*
U.S. Cl. 51—123 **3 Claims**



Tap grinder comprising a collet for small taps and centers for larger taps, means to rotate the tap at an angle to a wheel, and adjustable means to automatically advance the tap to be ground and retract the tap during non-grinding periods as the tap is rotated.

3,566,546
APPARATUS FOR GRINDING WELDED RAIL
Karl L. Lindmark, Rockford, Ill., assignor to Chemetron Corporation, Chicago, Ill.
Original application Nov. 21, 1966, Ser. No. 595,738, now Patent No. 3,509,667, dated May 5, 1970. Divided and this application Apr. 24, 1969, Ser. No. 852,128
Int. Cl. B24b *21/16, 23/06*
U.S. Cl. 51—140 **31 Claims**



Apparatus for grinding welds formed by welding rail sections in end to end relation to form a continuous rail. A pair of belt type grinding heads simultaneously grind the rail head running surface and the rail base with only

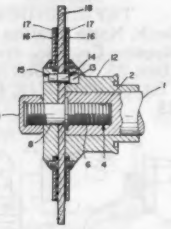
minimal areas adjacent the upset or weld areas being engaged by the belts. The rail is held in stationary position during the grinding and one of the heads is turned around the rail head to effect curvilinear or arcuate grinding while the other head grinds the underside of the rail base. The heads are moved longitudinally across the weld and are simultaneously moved transversely into and out of grinding engagement with the weld during each longitudinal pass so that each belt follows a curved path lying tangent to the rail at the upset, whereby maximum grinding occurs at the upset and depth of the grind feathers out as each head moves beyond the upset.

3,566,547

GRINDING WHEEL SPINDLE ASSEMBLY

Robert F. Lonaberger and Charles W. Stickler, Jr., Reading, Pa., assignors to Gray Tech Industries, Inc., Mohnton, Pa.

Filed Nov. 28, 1967, Ser. No. 686,022
Int. Cl. B24b *45/00*
U.S. Cl. 51—168 **3 Claims**



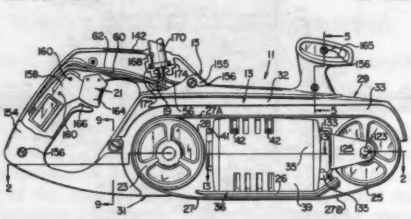
Spindle stub for grinding wheel machines, particularly cut-off machines, to eliminate the necessity of replacement of the spindle, also separate flanges to increase the spindle diameter and resist end thrust, as well as to permit reversal of the flanges to extend the life of the spindle, also the inclusion of multi-layer cushioning rings between the grinding wheel and flanges to further reduce wear of the flange faces and to reduce vibration.

3,566,548

DUST REMOVAL CONSTRUCTION FOR A BELT-TYPE SANDER

Jacobus J. Beckering, Greenville, S.C., and Allen G. Beares, Towson, Md., assignors to The Black and Decker Manufacturing Company, Towson, Md.

Original application Jan. 18, 1967, Ser. No. 610,191, now Patent No. 3,474,575, dated Oct. 28, 1969. Divided and this application July 10, 1969, Ser. No. 840,773
Int. Cl. B24b *23/00, 55/06*
U.S. Cl. 51—170 **19 Claims**



This invention relates generally to portable, power driven tools, and particularly to an improved, portable, belt-type sanding, polishing or burnishing device and housing and handle construction therefor. More specifically, the disclosure to follow describes a portable, power driven sanding, burnishing or polishing device of the type having a housing and spaced drive and idler pulleys rotatably supported on the housing for rotation about parallel axes.

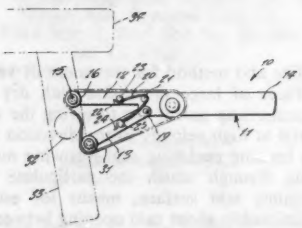
An electric motor supported upon the housing drives the drive pulley and an endless belt entrained over the drive and idler pulleys. The belt is suitably formed for sanding, burnishing or polishing and the bottom of the housing is open so that the working surface of the belt is exposed at this area. The housing described, as well as a handle detachably secured thereto, are of clam-shell like construction serving to trap various components of the device in place. In addition, the handle, the housing, and a detachable cover provide a passageway through which dust may be removed under the action of a suction fan. A detachable dust bag may be provided to collect the dust.

3,566,549

FLEXIBLE ALL PURPOSE DRILL ATTACHMENT

James A. Britton, Whitesburg, Tenn. 37891

Filed Jan. 21, 1969, Ser. No. 792,631
Int. Cl. B24b *23/00*
U.S. Cl. 51—170 **1 Claim**



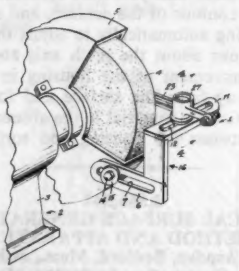
A sanding machine for the purpose of sanding cylindrical surfaces, the device comprising an endless sandpaper belt mounted around three rollers, one of which is power driven by a portable drill or the like, the work to be sanded being positioned adjacent the sandpaper belt at a location between the two other rollers whereby the sandpaper belt will be deflected into an arcuate configuration at this point so as to extend over a relatively large portion of the cylindrical surface being sanded.

3,566,550

ROCKER ARM GRINDING ATTACHMENT

Joseph Piccinino, 322 Center Deen Ave., Aberdeen, Md. 21001

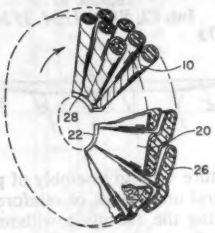
Filed Oct. 14, 1968, Ser. No. 767,200
Int. Cl. B24b *9/00, 41/06*
U.S. Cl. 51—216 **1 Claim**



A rocker arm grinding attachment for use with a bench grinder or like grinder consisting of a bracket which is adapted for adjustable attachment to the guard of a grinding wheel. The upper arm of the bracket is provided with

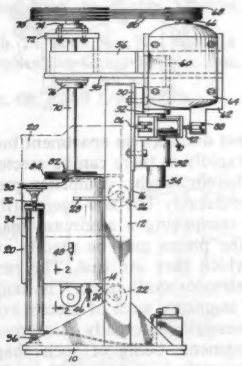
an elongated slot to slidably receive an arbor and which may be set at a desired position along the slot. The rocker arm is placed on the arbor and rotated manually to bring its lip to bear against the side of the grinding wheel.

3,566,551
SHAPED ABRASIVE
Elisha Winthrop Hall, Jr., Greenbush, Mass., assignor to F. L. & J. C. Codman Company, Rockland, Mass.
Filed Oct. 20, 1967, Ser. No. 676,895
Int. Cl. B24d *9/02, 15/00*
U.S. Cl. 51—336 **13 Claims**



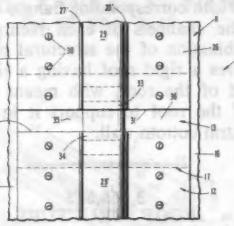
An abrasive member comprising a shell of sheet or fibrous material intimately surrounding a filler of abrasive grains and a resilient bonding agent, the shell having one or more openings exposing the filler; the shell material shown is destructible with wearing down of the abrasive surface; shown also are the filler of polyurethane foams; twisting or tight folding for compressing the matrix prior to cure and to form strong cord like elements; wetting of the shell for adding moisture for the cure; and rotary abrasive members with radial elements formed by this technique.

3,566,552
METHOD OF SURFACE FINISHING A WORKPIECE
Duane E. Hambright, Colon, Mich., assignor to Sutton Tool Company, Sturgis, Mich.
Original application May 18, 1967, Ser. No. 639,507, now Patent No. 3,516,203, dated June 23, 1970. Divided and this application July 7, 1969, Ser. No. 851,530
Int. Cl. B24b *1/00*
U.S. Cl. 51—317 **7 Claims**



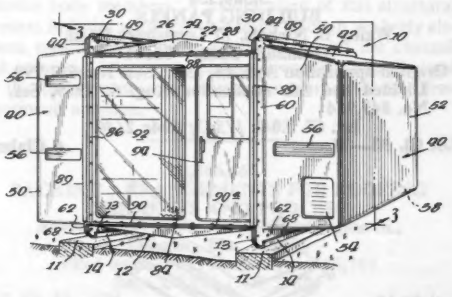
A method and means for surface finishing a workpiece. The method involves rotation of a workpiece immersed in a bed of finishing media of fluidized character and simultaneously effecting relative bodily movement of the workpiece and the bed in one or more directions. The means utilized to practice the method fluidizes the bed of media, swings the workpiece laterally in the bed or varies the depth of immersion in the bed, or both, and may periodically reverse the direction of rotation of the workpiece.

3,566,553
DRY JOINT SPLICE
Irving H. Kellman, Springvale, Maine, assignor to Sandell Manufacturing Company, Inc., Cambridge, Mass.
Filed Mar. 19, 1969, Ser. No. 808,507
Int. Cl. E04d *1/36, 3/38*
U.S. Cl. 52—57 **6 Claims**



A dry splice means for an expansion joint construction interconnects expansion joint members as in a roof expansion joint construction. The dry splice has a resilient, flexible weatherproof sheet operatively associated with spring means for urging the sheet to close a space between joint members with the sheet being constantly urged against the members substantially at opposed ends of the sheet. The splice means preferably comprises the resilient, flexible sheet with two opposed leaf springs attached to one surface of the sheet so that when the sheet is flexed, the springs are biased to urge the sheet into sealing engagement.

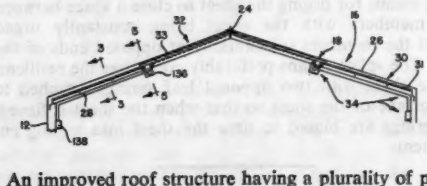
3,566,554
PREFABRICATED BUILDING
Martin B. Schaffer, Homewood, and Steven D. Kimmell, Skokie, Ill., assignors to Martin B. Schaffer and Joseph P. Baker
Filed Sept. 26, 1968, Ser. No. 762,915
Int. Cl. E04b *1/34*; E04h *1/12*
U.S. Cl. 52—64 **6 Claims**



A prefabricated building, either erected or knocked down for shipment in the form of a package kit, which includes a rigid central bottom wall, a rigid roof, and at least one rigid end shell. In a typical embodiment, there are two rigid end shells. In such an embodiment, each end of the roof has an attaching surface, and the inner

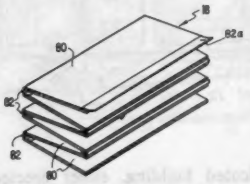
top wall of each of the end shells has an attaching surface, with means being supplied to tightly secure the attaching surface at each end of the roof to the attaching surface at the top inner edge of the corresponding end shell. The attaching surfaces may be provided by vertically extending flanges. Means are also provided to tightly secure each end of the central bottom wall to the bottom inner edge of the corresponding end shell. Each end shell has a rigid top and bottom wall and at least one vertical outer load-bearing wall. Support means are provided to hold the central bottom wall above ground level, and the bottom of each end shell unsupported and spaced above ground level when the building is installed in place at the building site. In one embodiment, reentrant flanges are used at the outer ends of the central bottom wall and the roof, with corresponding flanges on the end shells fitting into the channels of each reentrant flange. The simplest combination of the structural members just described involves a rigid roof having a rigid end shell at only one end of the roof, with means provided at the other end of the roof to support it in spaced relation above the central bottom wall.

3,566,555
ROOF STRUCTURE
Hans F. Schultz, Park Ridge, and Carl Radtke, Chicago, Ill., assignors to Ickes-Braun Glasshouses, Inc., Chicago, Ill.
Continuation of application Ser. No. 709,586, Feb. 27, 1968. This application Aug. 22, 1969, Ser. No. 853,613
Int. Cl. E04b *7/16*
U.S. Cl. 52—64 **2 Claims**



An improved roof structure having a plurality of parallel elongated framework members including guide channels for a movable roof covering panel which can be moved longitudinally along the roof to open or close the roof. The movable and fixed roof panels overlap to facilitate drainage. The movable panel is moved as desired in the guide channels by operation of a motor which is effective to prevent movement of the panels when it is not in operation.

3,566,556
BUILDING PANELS
Walter B. Nichols, 77 Lounsbury Road, Trumbull, Conn. 06611
Original application Apr. 18, 1967, Ser. No. 631,799. Divided and this application Aug. 6, 1969, Ser. No. 847,954
Int. Cl. E04b *1/343*; E04c *2/40*
U.S. Cl. 52—71 **6 Claims**

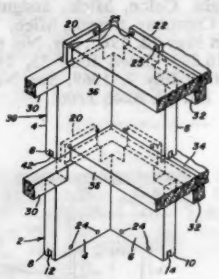


A panel unit comprising a plurality of rectangular panels interconnected by elongated flexible hinges which also act as seals between the panels. The outer panels in the unit have hook pile material adjacent their outer edges for purposes of connecting the unit to adjacent panel units of similar construction. The panels are made from plywood with an epoxy coating on their outer surfaces while the sealing strips are made from cross woven nylon with a vinyl coating and are bonded to the panels by an adhesive.

3,566,557
PREFABRICATED TRELLIS FOR THE EXECUTION WITHOUT TEMPORARY SUPPORTS OF FLOORING FOR CIVIL AND INDUSTRIAL STRUCTURES
Rino Comolli, Via Canova 31/A, Milan, Italy
Filed July 22, 1968, Ser. No. 746,473
Claims priority, application Italy, July 28, 1967, 18,933/67
Int. Cl. E04b *1/34, 1/20*
U.S. Cl. 52—73 **2 Claims**

Bridge structure with an assembly of prefabricated supporting structural units made of reinforced or prestressed concrete allowing the execution without temporary supports of bridge floors where the flooring is supported between the lateral boundaries thereof at an intermediate portion thereof on two spaced beam structures and having laterally overhanging portions projecting outwardly at both sides from said beams, said floors comprising a plurality of said structural units arranged side by side transverse to the longitudinal extension of the bridge and covered by a cast-in-situ concrete layer.

3,566,558
APARTMENT BUILDINGS AND THE LIKE
Joseph V. Fisher, Ridge Road, R.D. 1, Valencia, Pa. 16059
Filed Oct. 3, 1968, Ser. No. 764,822
Int. Cl. E04b *1/34*; E04c *1/10*; E04f *11/14*
U.S. Cl. 52—73 **3 Claims**

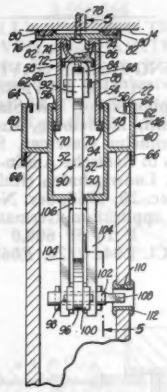


This patent discloses an apartment building that can be erected as rapidly as there can be erected its central core, which, as herein taught, comprises precast members of concrete, preferably but not necessarily reinforced with steel bars, comprising a straircase made in two pieces, such that the pieces may be readily extracted from the molds in which they are cast. The central core further comprises elevator-shaft space. The building is supported by internal segments, each of precast concrete, preferably but not necessarily internally reinforced wtih steel bars, with the segments being of such shape that one may readily be securely joined to another of similar shape and immediately above it, the segments having an angular shape, so that in a free-standing structure there is obtained superior resistance to shear stresses, the expense of ordinarily incident to the securing in place of internal segments, as by riveting, bolting, grouting or the like all being avoided.

3,566,559
DEMOUNTABLE WALL STRUCTURE

Wesley B. Dickson, Orange, Calif., assignor to Advanced Equipment Corporation, Anaheim, Calif.

Filed Dec. 23, 1968, Ser. No. 786,327
Int. Cl. E04b *2/18, 2/78*
U.S. Cl. 52—122 1 Claim

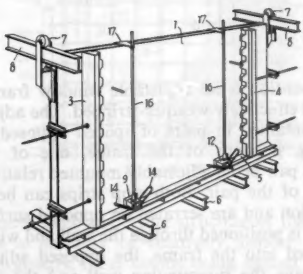


Demountable wall panels are disclosed which include centrally located panel sections, ceiling clamps mounted on the tops of these panels, spring means biasing these ceiling clamps away from the sections on which they are located, toggle means connecting the ceiling clamps on these sections and means for moving the toggle means so that the ceiling clamps are in either an extended position or retracted position in which they extend generally along the tops of the panel sections. These panels preferably also include inner engaging means located along their side edges and an adjustable bottom plate located along their bottoms.

3,566,560
PRE-CAST CONCRETE PANELS

Norman Edward Wakefield, Leatherhead, Stuart John Alexander, London, James Francis Morrish, Gerrards Cross, William Beck, Warlingham, Raymond Sturgis Groves, Fetcham, and Michael James Harvey, Orpington, England, assignors to Wates Limited, London, England

Filed Feb. 14, 1969, Ser. No. 799,164
Claims priority, application Great Britain, Jan. 20, 1969, 3,247/69
Int. Cl. E04b *1/41, 1/48*
U.S. Cl. 52—127 10 Claims

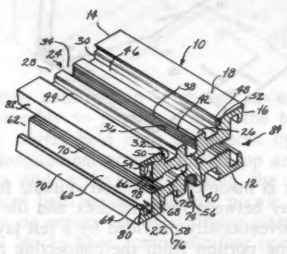


Two similar, rectangular, pre-cast, concrete, vertical wall panels disposed one above the other are joined together by a joint including a horizontal plate and a vertical attachment bar. The plate is the bottom wall of a short tube extending widthwise of the lower horizontal edge of the upper panel and is anchored in this panel by means of two oblique anchoring members fixed to the plate and embedded in the panel. The bar is embedded in the lower panel and its upper end zone projects through a central aperture in the plate. A nut screwed on this zone bears downwardly on the plate via a radially slotted washer.

3,566,561
CHANNELLED STRUCTURAL ELEMENTS

Francis P. Tozer, 1601 S. Hanley Road, St. Louis, Mo. 63144

Filed Oct. 8, 1968, Ser. No. 765,781
Int. Cl. E04c *3/32*
U.S. Cl. 52—127 10 Claims



A structural element is comprised of an elongated body member having a channel extending along one of its sides, the channel having in cross-section an open mouth and a channel floor between two lateral channel walls. A threaded slot extends along the length of the channel floor and is substantially U-shaped in cross-section, having threads running longitudinally along its slot walls. First and second channel-wall grooves are positioned opposite each other in the two lateral channel walls and extend longitudinally along the length thereof. The structural element may include brackets secured in the channel by bolts threadably engaging the threaded slot, sheet members enclosed within frames formed by a plurality of body members, sheet members slidably inserted within the channel-wall grooves and held therein by a spring element between the channel floor and the sheet member, and cross-shaped brackets for securing two body members together by bolt means threadably engaging the threaded slots of the respective body members. A modification of this structural element includes apertures extending through the body elements transverse to the longitudinal axis of the channel and a second aperture extending inwardly from the end of the body member in communication with the first-mentioned aperture.

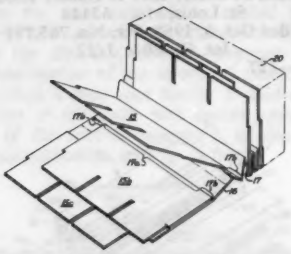
3,566,562
PACKING ARRANGEMENTS FOR ROOFING ELEMENTS AND PROCESS

Boyce Robert White, 908 E. Washington St., Orlando, Fla. 32801

Filed Sept. 19, 1968, Ser. No. 760,765
Int. Cl. E04d *1/28, 3/365*
U.S. Cl. 52—173 24 Claims

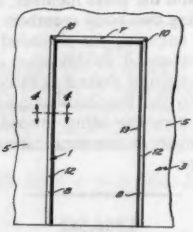
A packaging arrangement for shingles to be applied to a sloping roof or the like wherein the shingle elements are secured together in their upper portions, relative to the slope of the roof, by pleated connections which can be opened in an accordion fashion and, as connected, packaged and transported to the roof deck to be shingled. There, the leading shingle member is connected to the roof's ridge and the trailing shingle member is pulled

down the slope of the roof deck to the eaves with the pleated connections thereby being opened and drawn to lie flat against the roof deck, the intermediate shingles overlapping each other in a conventional manner. Several arrays of such shingle members are packaged together with laterally extending overlapping portions of adjacent arrays interwoven, the interwoven arrays being transported as a unit and placed on the roof simultaneously where, if not previously aligned, they are straightened out along the roof ridge, still however, interwoven. Then, after the leading shingles are secured, the entire unit of arrays is pulled down the roof deck. The pleated connect-



ing member is made of a material suitable for the intermediate layer between the roof deck and the shingles—a function conventionally provided by a felt layer. A laterally extending portion from the connecting member can be provided for each array so that there is a substantial overlapping of such intermediate layers of adjacent arrays. Instead of a pleated connecting member, other suitable folding members may be provided between adjacent shingle members and such folding members may also provide for a lateral displacement of every other shingle member when the folding members are aligned by pulling the array down the roof deck.

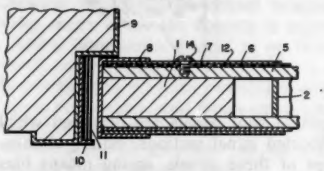
3,566,563
FILLER STRIP FOR DOOR FRAMES
Robert O. Ruff, Cincinnati, Ohio, assignor to Steelcraft Manufacturing Company, Cincinnati, Ohio
Filed Nov. 12, 1968, Ser. No. 774,877
Int. Cl. E06b *1/20*
U.S. Cl. 52—211 **2 Claims**



This disclosure relates to filler strips which are applied to the free edges of sheet metal door frames in order to compensate for disparate wall thicknesses about a door opening. The typical sheet metal frame for which the filler strip is intended, comprises a pair of vertical jamb members and the horizontal header, the members being generally of U-shape configuration, having slightly yieldable limbs. The free edges of the limbs each include an inturned flange extending toward one another, with a right angular lip extending from the inner edge of each flange.

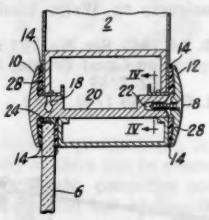
The filler strip is generally U-shaped in cross section and nests snugly about the inturned flange and angular lip of the door frame members so as to delineate a throat opening corresponding to the wall thickness about the marginal portion of the door opening. The filler strips are furnished in various thicknesses and are selectively mounted upon the frame members to compensate for variations in wall thicknesses, the filler strips being selectively applied according to disparate wall thickness as encountered in the field at installation of the door frame members.

3,566,564
FIRE RESISTING DOORS HAVING METALLIC OUTER LAYERS
Rudolf Gaeth, Limburgerhof, Fritz Stastny, Ludwigshafen, Bernhard Schmitt, Heidelberg, Rudolf Breu, Lambsheim, and Friedhelm Gaertner, Schauernheim, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany
Filed Dec. 20, 1968, Ser. No. 785,703
Claims priority, application Germany, Dec. 20, 1967, P 16 59 608.0
Int. Cl. E04c *2/24;* **E06b** *3/70*
U.S. Cl. 52—232 **6 Claims**



A fire-resisting door having stiffening members inside a door frame. Both the frame and the stiffening members are covered with an insulating layer and a metallic outer layer, the layers being joined in such a way that the union is destroyed by the action of heat.

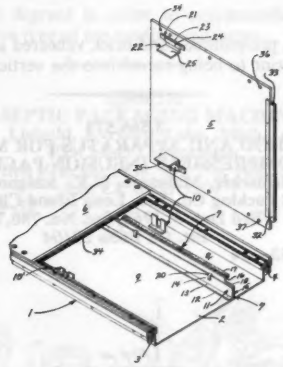
3,566,565
ADJUSTABLE WINDOW FRAME
Robert W. Pond, Bethel Park, Pa., assignor to American Air Filter Company, Inc.
Filed Dec. 4, 1968, Ser. No. 781,052
Int. Cl. E06b *1/20, 3/64*
U.S. Cl. 52—208 **4 Claims**



The invention is an adjustable window frame which is easily and effectively weather-stripped. The adjustable feature is contained in pairs of spaced opposed stop strips comprising portions of the frame, one of which stop strips of a pair being adjustably mounted relative the other stop strip of the pair. Both stop strips can be arcuate in cross section and are serrated on opposed surfaces. When the frame is positioned through the wall and window panes are inserted into the frame, the opposed adjustable stop strips engage the surrounding wall and the surrounding panes of glass at a slight angle leaving a small crevice which is filled between the walls and the strips and between the pane of glass and the strips with caulking and

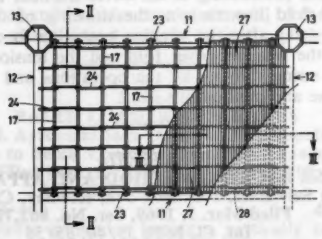
glazing material prior to frame installation. On securing the window frame the adjustable stop strip is forced inward causing both it and the other permanently fixed stop strip to move from a converging to a parallel path which in turn compresses the sealing material against the window pane and the wall giving an excellent gripping, securing and sealing operation.

3,566,566
FRICTIONALLY SECURED TRENCH DUCT COVER AND PARTITION
Stephen M. Janic, Parkersburg, W. Va., assignor to Textron Inc., Providence, R.I.
Filed Aug. 14, 1969, Ser. No. 850,032
Int. Cl. E04f *19/08*
U.S. Cl. 52—221 **3 Claims**



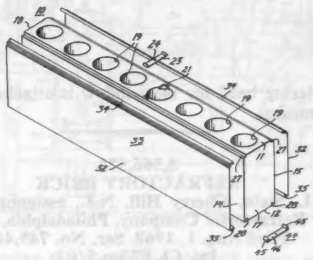
Means adaptable for use in holding down trench duct covers and for partitioning the trench into compartments including two L-shaped pieces to extend between the cover and the bottom of the trench, one of the pieces having a yielding arm which envelopes and grips the other so that the two pieces are held in fairly tight frictional engagement either for holding the cover or forming a partition.

3,566,567
CONCRETE LOAD SUPPORTING STRUCTURE
Yoshiro Watanabe, 8–20–604 2-chome, Mita, Minato-ku, Tokyo, Japan
Filed July 25, 1969, Ser. No. 844,944
Claims priority, application Japan, Apr. 24, 1969, 44/31,872
Int. Cl. E04b *1/16, 5/29*
U.S. Cl. 52—250 **3 Claims**



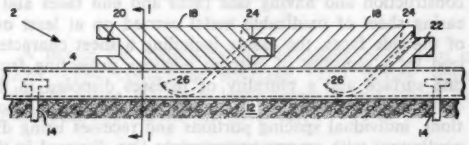
A concrete load supporting structure of the type which comprises a plurality of relatively slender beams supported on girders, these beams being spaced and held in place by spacer strips whereby the beams are protected from becoming buckled under the influence of a concrete load.

3,566,568
CELLULAR BLOCKS WITH COVER OF SHEET MATERIAL
Joseph Slobodian, Malvern, Pa. (% Phoenixville Lumber Co., 405 Bridge St., Phoenixville, Pa. 19460)
Filed Apr. 28, 1969, Ser. No. 819,571
Int. Cl. E04b *2/46, 2/48;* **E04c** *2/10*
U.S. Cl. 52—309 **11 Claims**



A building construction is shown having blocks for vertical assembly to provide a wall, the blocks having facings or covers held onto the blocks by flanges engaged in longitudinal grooves in the top and bottom of the blocks and with keys engaging the flanges. The blocks are of light weight synthetic plastic material and the facings or covers are of synthetic plastic sheet material. The blocks have communicating openings for insertion of reinforcing rods and for the pouring of concrete therein to strengthen and retain the blocks in assembled relation.

3,566,569
FLOORING STRUCTURE
Harry E. Coke, Southhaven, Miss., and Jack R. Pfeiffer, Memphis, Tenn., assignors to E. L. Bruce Co. (Incorporated), Memphis, Tenn.
Filed Apr. 4, 1969, Ser. No. 813,483
Int. Cl. E04b *5/00*
U.S. Cl. 52—376 **6 Claims**

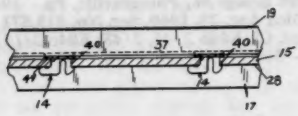


A flooring structure has a plurality of spaced parallel metal channels in each of which is secured a nailing strip. Floorboards are supported on the strip-channel assemblies and secured thereto by nails which pass through the floorboards and nailing strips and are clinched to the bottoms of the nailing strips. The strip-channel assemblies are secured to a foundation.

3,566,570
FASTENER FOR WINDOW MOLDINGS
Lyon D. Evans, Lakewood, N.Y., assignor to Hope's Windows, Inc., Jamestown, N.Y.
Continuation of application Ser. No. 672,553, Oct. 3, 1967. This application Nov. 13, 1969, Ser. No. 871,626
Int. Cl. E04f *19/02;* **E06b** *3/54*
U.S. Cl. 52—498 **7 Claims**

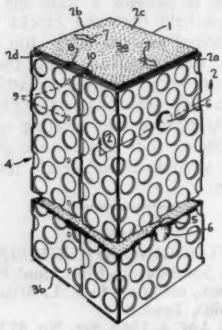
This disclosure relates to windows and more particularly, to an improved means of glazing windows. The improved means compensates a clip having a plate-like body member, a first locking blade, a second locking

blade and a glazing bead retention means. The locking blades extend through an opening in a support member



and a glazing bead for the window is attached to the retention means.

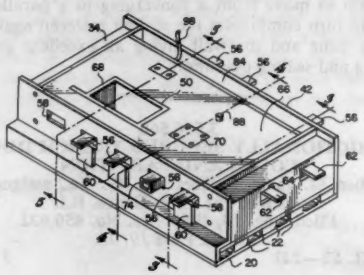
3,566,571
REFRACTORY BRICK
Joseph L. Stein, Cherry Hill, N.J., assignor to General Refractories Company, Philadelphia, Pa.
Filed Aug. 1, 1968, Ser. No. 749,468
Int. Cl. F23m *5/02*
U.S. Cl. 52—598 **2 Claims**



A refractory brick adapted for use in furnace roof construction and having side faces and end faces and a casing sheet of oxidizable metal carried on at least one of the side faces, the casing including a sheet characterized by a plurality of spacing portions projecting from one surface and a plurality of recesses disposed in the other surface thereof in alignment with the spacing portions, individual spacing portions and recesses being discontinuous with respect to a straight line disposed in the plane of the sheet. Preferably, the spacing portions are disposed in surface engagement with the brick side face and function to space the one surface of the sheet therefrom. The relative size, configuration and positioning of the spacing portions and recesses of the sheet permits substantially complete oxidation thereof during use without resulting in growth in overall sheet thickness, prevents interlocking of like sheets carried on adjacent bricks during installation thereof in a furnace roof, and maintains uniform bearing stress conditions in furnace roof brick joints.

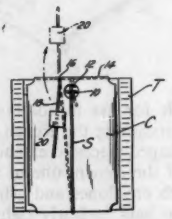
3,566,572
PREFABRICATED WALL STRUCTURE
Rudolph Purifoy Wilkinson, 623 Frensley, Ardmore, Okla. 73401
Filed Sept. 6, 1968, Ser. No. 758,164
Int. Cl. E04b *2/30;* **E04c** *2/06, 2/52*
U.S. Cl. 52—745 **9 Claims**

A preformed, hollow wall unit which can be used as a structural form member in a completed building, and a process for making such a wall unit. The wall unit is constructed, for example, of concrete and can be formed,



pre-wired, pre-plumbed and brick veneered in a horizontal position prior to being raised into the vertical position.

3,566,573
METHOD AND APPARATUS FOR MAKING COMPRESSIBLE INFUSION PACKAGE
Hans O. Irmscher, Malverne, N.Y., assignor to National Tea Packing Co., Inc., Long Island City, N.Y.
Filed Dec. 3, 1968, Ser. No. 780,757
Int. Cl. B65b *29/04*
U.S. Cl. 53—14 **16 Claims**

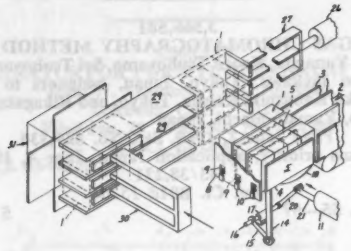


An improved method and machine for making an infusion such as a tea bag package, the package comprising the assembly of an infusion bag and a wrapper-cover folded over one end of and over the faces of the bag, the suspending string of the bag being wound about the assembly and the free end of the string being detachably anchored in a slit formed in the fold of the wrapper-cover, the method and machine improvements centering about the precreasing of the cover member to produce a defined fold line therein, the drawing of the free end of the string after the winding operation to string-cut the slit in the wrapper-cover fold and the tensioning control of the string through all the operations and steps of the machine and method.

3,566,574
CASE PACKING METHOD AND APPARATUS
Melvin Salwasser, P.O. Box 548, Reedley, Calif. 93654
Filed Mar. 3, 1969, Ser. No. 803,727
Int. Cl. B65b *35/40, 35/56*
U.S. Cl. 53—26 **6 Claims**

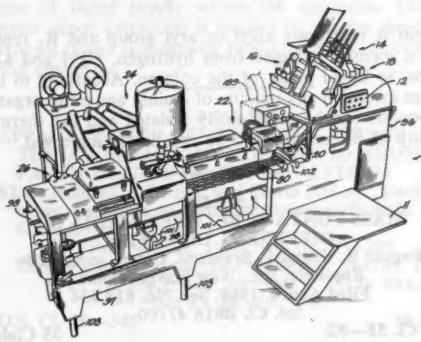
Apparatus and method for arranging a case load of packages and other articles and for inserting such load into a case. The invention is particularly applicable to the filling of a top loading case wherein the articles are vertically disposed when being transported to the casing operation and wherein the case is loaded when the same

is disposed with its top directed horizontally outwardly. The invention provides for the swinging of the entire load



through 90 degrees in order to accommodate it to the most effective type of top loading apparatus.

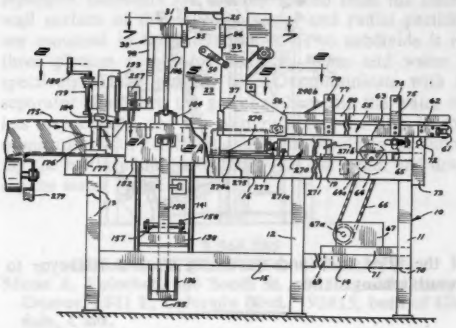
3,566,575
ASEPTIC PACKAGING MACHINE
Robert E. Lisiecki, Orchard Lake, Mich., assignor to Ex-Cell-O Corporation
Filed Feb. 26, 1968, Ser. No. 708,337
Int. Cl. B65b *3/04*
U.S. Cl. 53—37 **9 Claims**



An aseptic packaging machine for forming, aseptically treating, filling and sealing containers while protecting them with a clear air atmosphere after they have been aseptically treated by a bactericide. The aseptic treatment is accomplished by a fogging system to provide for total contact by the bactericide with the internal surfaces of the container and includes ease of removal of the residual bactericide after the treatment.

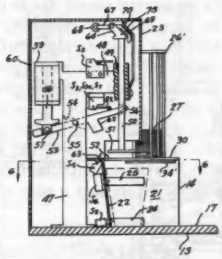
3,566,576
BALER LOADER APPARATUS
Richard H. Ayres and Jack D. Layer, Minneapolis, Minn., assignors to Bemis Company, Inc., Minneapolis, Minn.
Filed Mar. 17, 1969, Ser. No. 807,787
Int. Cl. B65b *35/50, 57/10*
U.S. Cl. 53—61 **44 Claims**

Baler loader apparatus having a vertically adjustable carrier assembly mounted on a frame, product containing bag transfer and blocking mechanism on the carrier assembly for transferring bags from the respective lane of the conveyor that is in part supported by said assembly to the collector plates and alternately blocking such transfer, and means on said assembly to translate the collector plates to a spread apart condition to deposit a layer of arranged product receiving bags on the stacking platform therebeneath. The stacking platform is lowered with each new layer of bags deposited thereon



until obtaining the desired number of layers and thence a ram is automatically operated to push the stacked layers through a spout into a baler bag.

3,566,577
MULTIPLE PAPER CUP CAPPER
Anthony C. Occhipinti, 219 Carondelet St., New Orleans, La. 70130
Filed July 15, 1969, Ser. No. 841,778
Int. Cl. B65b *57/02, 7/28*
U.S. Cl. 53—67 **14 Claims**

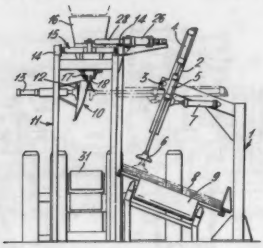


A device for dispensing and installing cover caps on paper cups containing beverage. The device senses whether a cup therein is large or small and selects and installs the appropriate size cover cap.

3,566,578
SACK FILLING APPARATUS
John C. Thorne, Maidstone, John L. Maddams, Rochester, John H. Fisher, Maidstone, Philip M. Hargrave, Rochester, and Frank R. Newnham and Donald F. Filmer, Maidstone, England, assignors to Reed Paper Group Limited, London, England
Filed June 3, 1968, Ser. No. 734,068
Claims priority, application Great Britain, June 9, 1967, 26,846/67
Int. Cl. B65b *43/30*
U.S. Cl. 53—126 **20 Claims**

Apparatus for the automatic filling and sealing of sacks, including suction pick-up means for lifting the sacks one by one from a stack, further suction means cooperable with the pick-up means to open the sack mouth with the sack held at its top corners by grippers mounted on a horizontally movable carriage, a filling spout mounted on the carriage and lowerable into the open mouth of the sack, means for traversing the carriage carrying the sack to a filling station where the filling spout is aligned with the outlet from a hopper, a vibratory posser platform

for agitating the sack whilst it is being filled, and cooperating pairs of chain drives for gripping the closed mouth

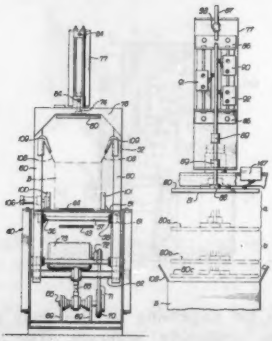


of the filled sack and traversing it on a conveyor to a mouth sealing station.

3,566,579
APPARATUS AND METHOD FOR PACKAGING CITRUS FRUIT

Kenneth F. Russell, deceased, late of Claremont, Calif., by Marie D. Russell, Claremont, Thomas L. Russell, San Rafael, and Douglas O. Russell, Los Angeles, Calif., heirs, assignors to Brogdex Company, Pomona, Calif.

Filed Nov. 18, 1968, Ser. No. 779,300
Int. Cl. B65b *1/22, 25/04, 43/54*
U.S. Cl. 53—24 **16 Claims**



A vibrating means having a station at which a box loosely and randomly containing a preselected number of fruit is positioned and firmly held while the box is subjected to vertical vibrations for a selected period of time. The vibratory apparatus includes a descending platen which moves into covering relation with the open top of the box to confine fruit in the box and to superimpose a descending planar surface, which is vibrating with the same amplitude, frequency and phase as the box, into close proximity with the fruit so as to facilitate movement of the preselected number of fruit into a desirable tightly packed pattern or arrangement.

3,566,580
MEMBRANE SEPARATION

Norman N. Li, Edison, N.J., assignor to Esso Research and Engineering Company

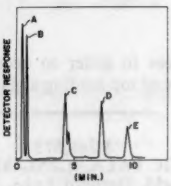
No Drawing. Filed Nov. 27, 1968, Ser. No. 779,650
Int. Cl. B01d *59/12*
U.S. Cl. 55—16 **15 Claims**

The separation of mixtures; in which the various elements have different degrees of solubility in a liquid is enhanced by cocurrently permeating vapor from said liquid and the mixture through a semi-permeable membrane; the membrane must have an attraction for said liquid.

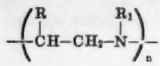
3,566,581
GAS CHROMATOGRAPHY METHOD

Masaya Yanagita, Kaoru Tsuboyama, Sei Tsuboyama, and Nobuo Ikekawa, Tokyo, Japan, assignors to Kaken Kagaku Kabushiki Kaisha, Tokyo, and Rikagaku Kenkyusho, Yamato-machi, Japan

Filed June 2, 1969, Ser. No. 829,336
Claims priority, application Japan, June 4, 1968, 43/38,221
Int. Cl. B01d *15/08*
U.S. Cl. 55—67 **5 Claims**



Gas chromatography using a polymer having the following general formula:

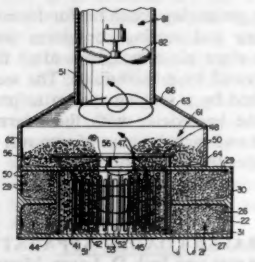


wherein R represents alkyl or aryl group and R_1 represents a member selected from hydrogen, alkyl and aryl groups, as liquid phase of the column. According to the present invention any mixture of amines and other organic compounds can be more easily isolated and the thermal stability of the column can be excellently improved.

3,566,582
MASS CONTACT BETWEEN MEDIA OF DIFFERENT DENSITIES

Eugene S. Yankura, Branford, Conn., assignor to Entoleter, Inc., New Haven, Conn.

Filed Apr. 4, 1969, Ser. No. 813,634
Int. Cl. B01d *47/00*
U.S. Cl. 55—92 **35 Claims**



A method and apparatus for effecting efficient mass contact between two media of different densities is disclosed. The one of said media that is of lesser density is caused to obtain a vortical flow pattern, by means of a circular vaned chamber. The second medium, the one having the greater density, is entrained in said flow pattern in particulate form, and is thereby caused to form a dense cloud of particles within said vortical flow. An upper limit on particle size within the cloud is established by the diameter of the chamber, and by an apertured wall

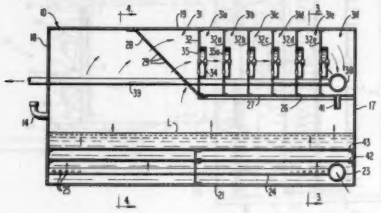
construction therefor, whereby oversize particles are caused to migrate outwardly from the chamber under the influence of centrifugal force.

3,566,583

APPARATUS FOR PURIFYING EXHAUST FUMES

John W. Ashmore, 13431 Budlong, Gardena, Calif. 90249

Filed Jan. 29, 1969, Ser. No. 794,907
Int. Cl. B01d *47/02*
U.S. Cl. 55—255 **5 Claims**



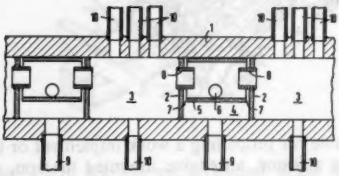
An apparatus for removing impurities from the exhaust of internal combustion engines wherein the exhaust gas is fed directly into a liquid solution after which water vapor carried by the cleaned exhaust gas is extracted before discharge thereby avoiding any substantial reduction of liquid supply within the apparatus. Complete water vapor extraction is insured by passing the cleaned exhaust fumes sequentially through a series of condensation chambers.

3,566,584

APPARATUS FOR CENTRIFUGAL AND GRAVITATIONAL SEPARATION OF LIQUID FROM GAS, PARTICULARLY WATER FROM STEAM

Klaus Ruthrof, Erlangen, and Erwin Kramer, Furth, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany

Filed Nov. 12, 1968, Ser. No. 774,999
Claims priority, application Germany, Nov. 21, 1967, P 15 76 878.2; Dec. 28, 1967, P 15 76 884.0
Int. Cl. B01d *45/12*
U.S. Cl. 55—345 **10 Claims**



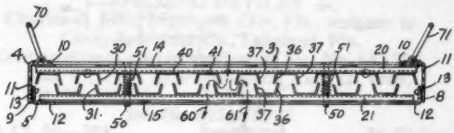
An apparatus for separating two-phase mixtures and preferably for separating water from steam at the end of the evaporator heating surfaces in a forced-flow boiler. The horizontally elongated vessel, such as the collector of the boiler system, is provided with rotationally symmetrical inserts which form respective separator chamber structures and are mutually spaced axially from each other so as to form gas chambers between each other. The two-phase mixture is tangentially supplied to each separator structure wherein it becomes centrifugally and gravitationally separated into steam and water. The steam passes through coaxial stub tubes in the axial ends of each separator chamber into the adjacent gas chambers, whereas the separated water drains through outlet openings. In one preferred form of the apparatus, the end covers of the individual separator chambers form partitions which transversely subdivide the interior of the collector vessel. In another form of the apparatus, the separator chambers are radially spaced from the interior wall surface of the collector vessel and radial partitions are mounted in the interspace so as to subdivide it into three plenum spaces for mixture, steam and water respectively. These plenum spaces communicate with the separator chambers, the gas chambers and the water outlets respectively, and the plenum spaces are also in communication with external conduits or pipelines for supplying the mixture and for withdrawing the steam and draining the water respectively.

3,566,585

GREASE-EXTRACTING APPARATUS

Mona A. Voloshen, 600 South St. 91202, and Danny B. Deaver, 1541 E. Colorado Blvd. 92015, both of Glendale, Calif.

Filed July 7, 1969, Ser. No. 847,483
Int. Cl. B01d *45/06*
U.S. Cl. 55—435 **2 Claims**



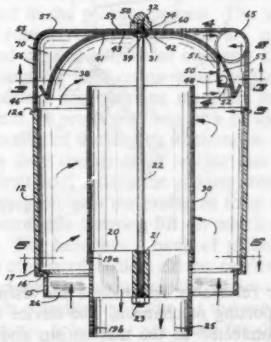
The filter of the invention has two frames in adjustable telescopic relationship to control the volume of air flow therethrough. Each frame carries an aligned row of spaced apart baffle members with the row of one frame in staggered or offset relationship with the row of the other frame, whereby hot organic laden air drawn through the filter circulates between the rows in a devious path in its passage to a vent duct. The baffle members are coated with a non-adherent material such as a fluorocarbon resin, whereby the hot organic material which normally would adhere to the baffle members will drip or flow therefrom under gravity into a trough for disposal.

3,566,586

AIR CLEANER FOR INTERNAL COMBUSTION ENGINE

Purden S. Langness, Fargo, N. Dak., assignor to Dustmaster Corporation, Harvey, N. Dak.

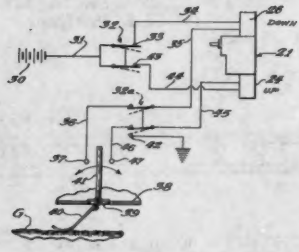
Filed June 9, 1969, Ser. No. 831,444
Int. Cl. B01d *45/12*
U.S. Cl. 55—451 **1 Claim**



An air cleaner for a motor vehicle comprising a cylindrical housing having an annular louvered inlet passage and a central passage, a deflector plate overlying said

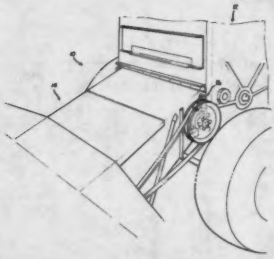
central passage, a tangential outlet passage through said deflector plate adjacent its periphery, and an outlet passage in said housing cooperative with said last mentioned passage whereby contaminants in the air stream entering the annular passage are centrifuged and exhausted through said outlet passages with a result that substantially clean air is drawn through said central passage into the carburetion system of the vehicle.

3,566,587
HEADER CONTROL SYSTEM FOR MECHANICAL COTTON PICKING MACHINE
Donald D. Janssen, Sac City, Iowa, assignor to Noble Manufacturing Company
Filed Oct. 9, 1968, Ser. No. 766,068
Int. Cl. A01d *67/00*
U.S. Cl. 56—11 **5 Claims**



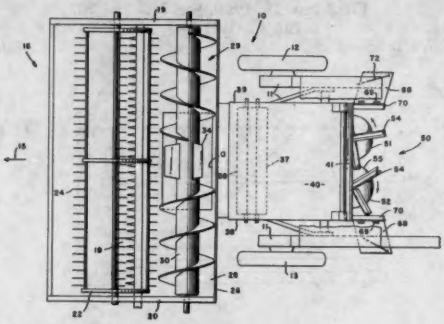
A control system for hydraulically raising and lowering cotton picking machine headers involving an electrical-hydraulic circuitry supplemental to the hydraulic power system of the machine and in which ground level is sensed mechanically to operate electrical circuitry feeding signal to hydraulic power to the raising and lowering mechanism in parallel with the hydraulic circuitry on the machine.

3,566,588
MOUNTING MECHANISM FOR HARVESTING ATTACHMENT
Robert L. Dahlquist, Rock Island, Ill., assignor to J. I. Case Company, Racine, Wis.
Filed Dec. 6, 1968, Ser. No. 781,724
Int. Cl. A01d *41/02, 41/04, 41/10*
U.S. Cl. 56—20 **7 Claims**



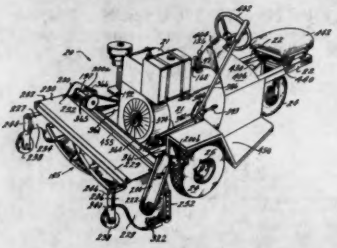
A device for releasably retaining a harvesting attachment on a supporting mechanism. The device includes a first member connected to the mechanism and having a retaining portion and inclined surfaces for guiding a lug on a second member carried by the attachment into the retaining portion with locking means for securing the members to each other.

3,566,589
HARVESTING MACHINE
Edmund O. Howell and John K. Hale, New Holland, and Horace G. McCarty, Leola, Pa., assignors to Sperry Rand Corporation, New Holland, Pa.
Filed Sept. 27, 1968, Ser. No. 763,149
Int. Cl. A01d *43/00*
U.S. Cl. 56—23 **18 Claims**



A harvesting machine in which a given width of crop material is cut and laterally consolidated into a narrow mass and then deposited in a rearwardly located mechanism which scatters the material laterally for deposit on the ground in a swath wider than the narrow mass.

3,566,590
MACHINE FOR PROPELLING A WORK IMPLEMENT
Carl Van Ausdall, Box 178, Bradenton, Fla. 33506
Original application Oct. 24, 1965, Ser. No. 504,792, now Patent No. 3,461,656, dated Aug. 19, 1969. Divided and this application Aug. 11, 1969, Ser. No. 848,908
Int. Cl. A01d *35/24*
U.S. Cl. 56—26 **6 Claims**

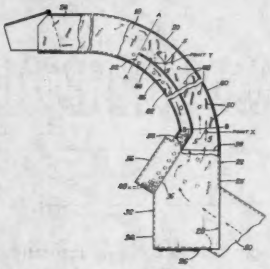


A machine for propelling a work implement or the like, comprising a frame, an engine mounted thereon, a transmission for the engine, a three-point-to-ground suspension for the machine, the engine being disposed above an axle carrying a pair of tires, and a single rotatably mounted tire disposed rearwardly. A first power train connects together the transmission and axle for providing motive power to the machine. Steering means for the operator is connected to the rear tire. A pair of bracket means including trunnion mountings depends from a cross-bar forwardly of the machine, for supporting the work implement. A pair of levers is pivotally attached to the frame and to which the cross-bar is secured, for swivelling the work implement independently of movement of the machine, thereby providing for floating movement of the work implement. A second power train means is connected to a secondary power output shaft of the transmission, extending to a trunnion mounting in one of the bracket means and provides for actuation of the work implement.

3,566,591
COTTON HARVESTER WITH PNEUMATIC GREEN BOLL SEPARATOR

Albert G. Blanton and Wyatt T. Gable, Jr., Memphis, Tenn., assignors to International Harvester Company, Chicago, Ill.

Filed Mar. 21, 1968, Ser. No. 714,822
Int. Cl. A01d *45/20*
U.S. Cl. 56—30 8 Claims

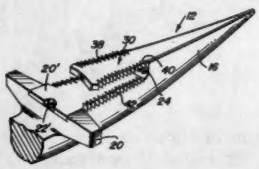


Cotton harvester incorporating a staged separator which includes a pneumatic delivery conduit having a curved segment or elbow through which an air stream is blown, and having a chute on the inside turn of the elbow which effectively reduces the cross-sectional area in that portion of the conduit producing a venturi effect, the attendant air stream charatceristics thereby conducing separation of the heavy green bolls which drop out of the main air stream and roll down the chute which segregates them.

3,566,592
MOWER GUARD

Emil A. Jerman and Frank E. Marshall, both of Verdigre, Nebr. 68783

Continuation-in-part of application Ser. No. 665,358, Sept. 5, 1967. This application Aug. 13, 1969, Ser. No. 849,797
Int. Cl. A01d *55/10*
U.S. Cl. 56—311 14 Claims



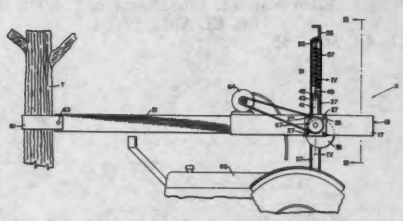
A finger guard for the reciprocating sickle bar of a mower having an upper lip spaced from a lower ledger plate to form a converging slot through which the sickle bar extends. Teeth cut directly onto the side edges of the upper lip trap stalks to facilitate cutting thereof by the triangular blade sections of the sickle bar.

3,566,593
VIBRATOR MEANS

Paul M. Whitfield, Rte. 2, Box 320, Jackson, Miss. 39209

Filed Sept. 27, 1968, Ser. No. 763,064
Int. Cl. A01g *19/00*
U.S. Cl. 56—328 15 Claims

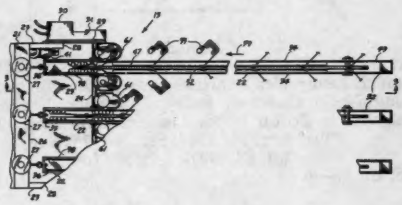
An apparatus for transmitting vibratory forces along an elongated boom, having a pivot at one of its ends and a single driven eccentric rotor adjacent the opposite end thereof. The rotary motion of the rotor is utilized for transmitting reciprocating vibrating forces through the boom and a pivot into a tree trunk, tree limb, or object as desired.



3,566,594
TREE FRUIT HARVESTER AND PICKING DEVICES

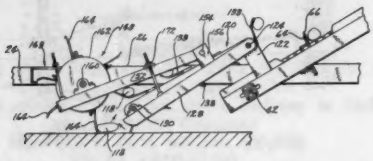
Charles R. Ellis, Highlands City, Fla., assignor to Citrus Industries Co., Lakeland, Fla.

Continuation-in-part of application Ser. No. 653,791, July 17, 1967. This application Aug. 12, 1969, Ser. No. 849,414
Int. Cl. A01g *19/08*
U.S. Cl. 56—328 26 Claims



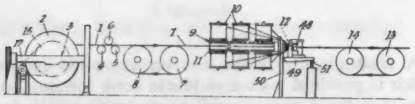
A fruit picking device has an elongated implement which is provided with a yieldable hook forming portion that includes a stem straddling assembly which is provided with pivotally biased joints and an interconnecting slender element. The element is so arranged as to cause bending of the stem at the calyx of an attached fruit body while the yieldable nature of the hook portion provided by the biased joints causes the suspended fruit body to be twisted in the picking process. The joints serve as fruit body contact components and are made of fitted semispherical or semiellipsoidal elements that provide a hollow housing for the biasing means, although solid resilient cylindrical joint forming members are shown in a modified form. A preferred form of a picking device embodies a plurality of the picking implements in an arrangement where they cooperate in seizing and retaining the suspended fruit body during the picking process. A mobile harvester equipped with the preferred form of picking device has a turntable carrying lift on which a picker head is mounted. The head has a bank of picker mechanisms which have elongated endless driven carriers in the form of endless chain and on which the devices are mounted and biased in a trailing attitude. At the proximal ends of the mechanisms, provisions are made for dislodging fruit grasped by the devices, and a structure is provided along the return path for the devices and which maintains the yieldable hook portions in straightened positions so as to avoid branch and foliage damage.

3,566,595
APPARATUS FOR PICKING EARS OF CORN FROM THE GROUND
Raymond Milbrandt and Clarence Milbrandt, both of Buffalo Center, Iowa 50424
Filed Nov. 12, 1968, Ser. No. 774,978
Int. Cl. A01d 87/04
U.S. Cl. 56—345 5 Claims



An apparatus for picking ears of corn from the ground including a wheeled frame means adapted to be pulled by a prime mover such as a tractor or the like. A pickup means is mounted on the forward end of the frame means and is adapted to pick the ears of corn from the ground and deposit the same on a rearwardly extending conveyor. The conveyor is adapted to convey the ears to a hopper or other suitable receptacle at the rearward end of the frame means. A blower means is mounted on the frame means below the conveyor and is adapted to force air upwardly through the ears of corn on the conveyor to blow any debris, such as cornstalks, trash, etc., therefrom. A deflecting shield is mounted over the conveyor and is adapted to deflect the debris being blown from the conveyor rearwardly from the apparatus.

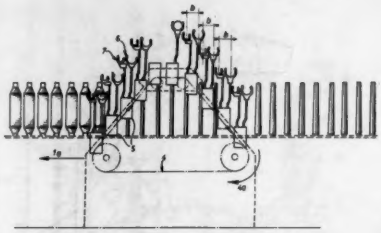
3,566,596
MANUFACTURE OF WIRE ROPES OR STRANDS
Kenneth Pennycuick, Northill Grange, near Biggleswade, and Philip Christian, Balby, Doncaster, England, assignors to British Ropes Limited, Doncaster, England
Filed Aug. 12, 1968, Ser. No. 751,918
Int. Cl. D07b 3/06, 7/10
U.S. Cl. 57—6 11 Claims



In the manufacture of wire ropes, particularly locked coil ropes, wherein a layer of wires or strands is twisted onto a core, which may be constituted by an inner core covered with one or more previous layers of wires in strands, the improvement is made of continuously measuring the back tension and torque in the core immediately ahead of the twisting step. Continuous quality control is thus obtained and if the values deviate unduly, connections may be applied, either automatically or manually. The invention comprises both apparatus and method.

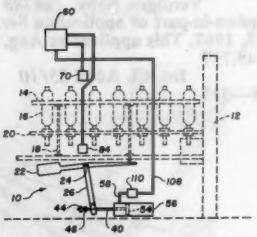
3,566,597
DEVICE FOR AUTOMATICALLY SUBSTITUTING EMPTY BOBBIN TUBES FOR CHARGED BOBBINS IN RING SPINNING AND TWISTING MACHINES
Francesco Foglio Para, Trivero Ponzone, Italy, assignor to Soc. per Az. Cit Carrelli Industriali Fessili, Milan, Italy
Filed Dec. 5, 1968, Ser. No. 781,323
Claims priority, application Italy, Jan. 26, 1968, 50,289/68, Patent 825,727
Int. Cl. D01h 9/10
U.S. Cl. 57—53 18 Claims

Charged bobbins on a row of spindles in a spinning machine are automatically replaced in succession by empty bobbin tubes by means of a device which is moved progressively along the front of the row of spindles. Carriages are moved on the device around a closed vertical path in the form of an isosceles trapezium with its shorter base uppermost, each carriage having a pair of pivoted arms which respectively remove charged bobbins



and fit empty bobbin tubes on respective said spindles as the carriages ascend and descend respectively. The movement of the carriages around the path is synchronised with the movement of the device as a whole, the length of the upper horizontal run of the path being such that the respective arms are aligned during operation with the respective spindles.

3,566,598
AUTOMATIC RING-RAIL DOWNING SYSTEM
Paul C. Godfrey, Enoree, S.C., assignor to Byars Machine Company, Laurens, S.C.
Filed Oct. 30, 1968, Ser. No. 771,870
Int. Cl. D01h 9/14; B65h 51/16, 54/28
U.S. Cl. 57—54 8 Claims

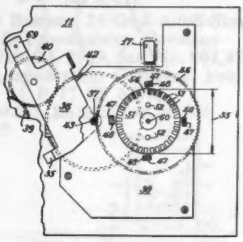


The instant invention utilizes a pneumatic mechanism having an air cylinder connected with a lever fixedly attached to the cross-shaft of a conventional spinning frame. Alternatively, the air cylinder may be connected with the traverse rod by a chain. A plurality of pneumatic switches and valves are located to permit control, by the reciprocating ring-rail, of a pneumatic system contained in a control box positioned near the spinning frame.

3,566,599
DIGITAL INTERVAL TIMER WITH INTERVAL END SIGNAL
Ronald M. Bassett, Chicago, Ill., assignor to International Register Company, Chicago, Ill.
Filed July 8, 1969, Ser. No. 839,979
Int. Cl. G04f 3/04
U.S. Cl. 58—21.14 15 Claims

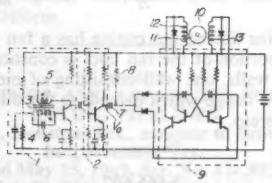
A synchronous motor operates a ratchet mechanism which permits a spring to drive an interval dial in a stepwise fashion to cause the interval time remaining to appear as an integer in registry with a viewing window.

Ratchet teeth rotatable with the interval dial are periodically lifted to move an extension of one of the teeth out of engagement with stationary ratchet teeth and allow the interval dial to shift to display the next lower time integer. A cam follower cooperates with a cam rotatable



with the interval dial to maintain the driving connection to the synchronous motor during the interval, to disengage the connection at the end of the interval, and to shift a buzzer arm into operative relation to the magnetic field of the motor to signal the end of the interval. The interval dial then is manually rotated to the "off" position and the buzzer arm ceases to operate.

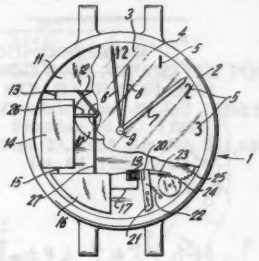
3,566,600
ELECTRIC TIME-PIECE
Koichi Yoshimura, Kadoma-shi, and Masahiko Shiota, Kirakata-shi, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed June 21, 1968, Ser. No. 738,877
Claims priority, application Japan, July 24, 1967, 42/48,039, 42/48,040, 42/64,589, 42/64,590, 42/64,591, 42/64,593; July 28, 1967, 42/65,761; Aug. 9, 1967, 42/51,605
Int. Cl. G04c *3/00*
U.S. Cl. 58—23 **11 Claims**



An electric time-piece, wherein a magnetic or electric induction field of the commercial or line frequency which is leaked into the surrounding space is detected by commercial frequency detecting means, and a synchronous motor is driven in synchronism with signals resulting from the detection to thereby drive the time-piece mechanism connected with the synchronous motor.

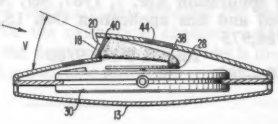
3,566,601
CRYSTAL OSCILLATOR WATCH
Lewis B. Shrady, Irvington, N.Y., assignor to Timex Corporation
Filed Jan. 30, 1969, Ser. No. 795,242
Int. Cl. G04c *3/00*
U.S. Cl. 58—23 **2 Claims**

An electronic watch includes a power source, a time base, a drive circuit and time indicating means. The time base is a piezoelectric crystal oscillator, specifically an astable multivibrator having a low duty cycle which



pulses the crystal at the fundamental or a subharmonic of its natural frequency.

3,566,602
OPTICAL DISPLAY DIGITAL WATCH
John M. Bergey, Lancaster, and Kenneth W. Derr, Quarryville, Pa., assignors to Hamilton Watch Company
Filed June 25, 1968, Ser. No. 739,877
Int. Cl. G04b *19/30*
U.S. Cl. 58—50 **24 Claims**

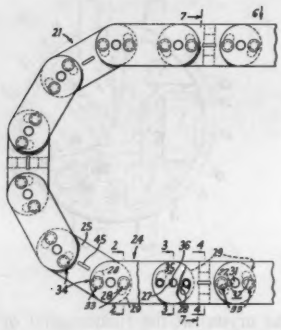


The watch has hour and minute wheels driven by a movement, the wheels carrying respective hour and minute information on annular areas thereabout. A display window is provided through the upper face of the watch at an angle to the plane of the watch. Curved, fuse-tapered, fiber optical bundles are provided for transmitting light carrying the time information on the wheels to an image surface adjacent the display window whereby, as the wheels rotate, a digital time readout is displayed in the window. In one form, the wheels are provided with luminous time indicia. In another form, a radioactive light source is carried within the watch casing to illuminate the time information on the wheels for digital time display under dark or semidark conditions. In a further embodiment, an optical bar segment in the general shape of a squared figure 8 and coded time indicia on the wheels cooperate to provide a digital time readout.

3,566,603
CABLE DRAG CHAINS
Everard Hamilton Chadwick, Arnold, England, assignor to Cable Equipments Limited, Nottingham, England
Filed July 2, 1968, Ser. No. 741,977
Int. Cl. F16g *13/16*
U.S. Cl. 59—78.1 **13 Claims**

This disclosure relates to drag chains for guiding cables from a fixed supply point to a movable point of utilization. The drag chain comprises alternate pairs of link plates and single link plates which are pivoted together. The link plates are pivotable about a ball-bearing. Stop pins held by the pair of link plates

are slidable in arcuate slots in the single link plates and limit the angle through which the links can pivot relative to one another. A nylon anti-friction pressure pad is provided between facing surfaces of the link plates.



3,566,604

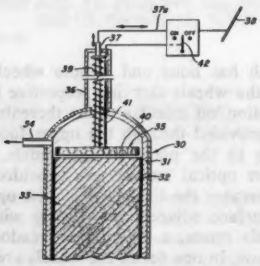
APPARATUS FOR CATALYTICALLY CONTROLLING DECOMPOSITION OF A SOLID GAS PRODUCING BODY

Wayne A. Proell, Seymour, Ind., assignor to Standard Oil Company, Chicago, Ill.

Original application Apr. 7, 1967, Ser. No. 629,294. Divided and this application Oct. 15, 1968, Ser. No. 788,975

Int. Cl. F02k 9/00

U.S. Cl. 60—200 8 Claims



Apparatus and process for controlled decomposition of gas forming body by contacting the body, which is incapable of controlled, sustained decomposition, with movable catalyst effective to cause decomposition, and heating the catalyst.

3,566,605

ROCKET NOZZLE POWER CONVERTER

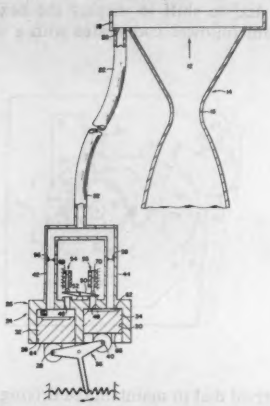
J. C. Dunaway, Falkville, Ala., assignor to the United States of America as represented by the Secretary of the Army

Filed June 3, 1969, Ser. No. 830,070

Int. Cl. F02k 11/00

U.S. Cl. 60—200 10 Claims

Mechanism for converting the power from a rocket nozzle without a reduction in thrust. The rocket nozzle is provided with indentations or undercuts near its exit and as thrust producing gases flow by the undercuts to the atmosphere, air is entrained from a conduit means connected to the nozzle at the position of the indentations or undercutting. The conduit means connects to a bell crank mechanism or other force transmitting members.



An upstream fixed orifice provided in the conduit and a downstream variable orifice provides a means for varying the pressure obtained from the rocket nozzle.

3,566,606

GAS TURBINE DUCTED FAN ENGINE

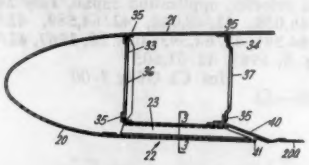
James Oswald Mortlock, Derby, England, assignor to Rolls-Royce Limited, Derby, England

Filed May 16, 1969, Ser. No. 825,308

Claims priority, application Great Britain, May 28, 1968, 25,484/68

Int. Cl. F02k 3/04; F04d 29/58

U.S. Cl. 60—226 10 Claims



A gas turbine ducted fan engine has a fan housed in a fan duct. A portion of the fan duct is constituted by two spaced apart walls, one wall consisting of members each of which has a flange which extends to the other wall and is attached thereto.

3,566,607

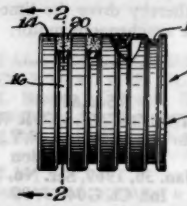
CORRUGATED DRAINAGE TUBES

Marty E. Sixt, Newark, Del., assignor to Advanced Drainage Systems, Inc., Middletown, Del.

Continuation-in-part of application Ser. No. 663,051, Aug. 24, 1967. This application Feb. 14, 1968, Ser. No. 705,482

Int. Cl. E02b 11/00; F16l 11/12

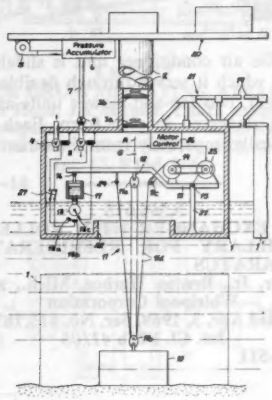
U.S. Cl. 61—11 2 Claims



A flexible corrugated drainage tube having alternating annular peaks and valleys and a plurality of openings ar-

ranged transversely to the longitudinal axis of the tube. Filter media covers the slotted openings so that liquid draining through the openings into the interior of the tube initially passes through the filter media.

3,566,608
SUPPORT FOR TRANSPORTABLE OFF-SHORE ISLAND
Hubertus Ramme, 25 Graf-Adolf-Strasse, 5758 Frondenberg, Germany
Filed Feb. 24, 1969, Ser. No. 801,472
Claims priority, application Germany, Feb. 22, 1968, P 17 08 547.1
Int. Cl. B63b *35/44, 43/06*
U.S. Cl. 61—46.5 **3 Claims**

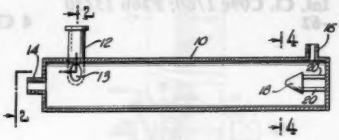


A leg supporting a maritime platform comprises a buoyant base held submerged by a weight resting on the sea bottom, the weight being tied to the base by a hoisting cable whose tension controls a pair of valves for partly flooding or venting the base to reduce or increase its buoyancy in a manner compensating for changes in the load of the platform.

3,566,609
METHOD AND APPARATUS FOR LAYING PIPELINES
Leif H. Smith, Houston, Tex., assignor to Brown & Root, Inc., Houston, Tex.
Filed May 15, 1969, Ser. No. 824,893
Int. Cl. B63b *35/04;* **F16l** *1/00*
U.S. Cl. 61—72.3 **26 Claims**

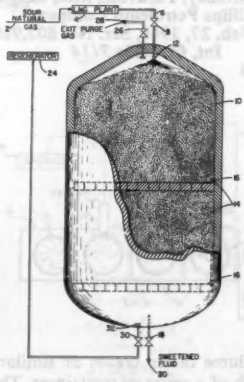
A method and apparatus for laying pipelines or other elongate flexible means on a submerged surface using a variable buoyancy, articulated ramp, pivotally connected to a floating vessel means. The articulated ramp is formed by a string of buoys pivotally interconnected by flexible or rigid spacers. The pivotal connections may provide for horizontal, vertical, or universal movement of the buoys. Each of the buoys is provided with a depending cradle for slidably supporting the pipeline. The buoys are at least partially flooded in response to "stripping-out" of the pipeline from the cradles so that the buoyancy of the ramp is adjusted in response to changes in the supported pipe weight, whereby desirable stress conditions on the pipeline leaving the ramp are maintained.

3,566,610
METHOD AND APPARATUS FOR SEPARATING FLUIDS
Cosmo Dominic Fiore, 59—25 155th St., Flushing, N.Y. 11355
Filed Sept. 23, 1968, Ser. No. 761,588
Int. Cl. F25b *9/02*
U.S. Cl. 62—5 **26 Claims**



A method and apparatus for separating a fluid into at least a more dense and less dense effluent stream which is effected by introducing the fluid tangentially into a near end of a cylindrical chamber through an inlet therein. The less dense portion is removed through a necked down, axially aligned, first exhaust port in the near end of the cylindrical chamber and the more dense portion is removed at the far end through a second exhaust port in the periphery thereof. The radii of a circular body in the cylindrical chamber upstream and adjacent the second exhaust port and of the cylindrical chamber adjacent the inlet, determine the density value about which the separation takes place for a specific flow rate.

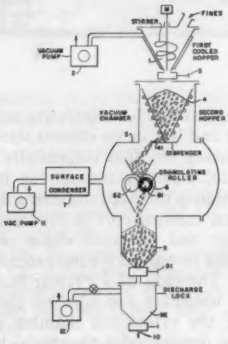
3,566,611
LIQUID PHASE LOW TEMPERATURE SWEETENING LNG
Eugene L. Sterrett, Hacienda Heights, Calif., assignor to Marathon Oil Company, Findlay, Ohio
Filed May 9, 1968, Ser. No. 727,933
Int. Cl. F25j *3/00, 3/08*
U.S. Cl. 62—18 **10 Claims**



This process involves the liquid phase sweetening of natural gas comprising first liquefying the natural gas containing dissolved sulfur-containing compounds followed by removal of the sulfur-containing compounds

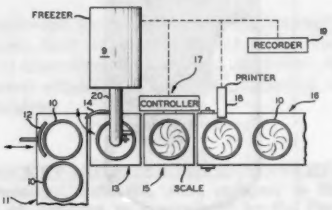
from the liquefied natural gas effluent by adsorbing them on a molecular sieve. Substantially all of such impurities as hydrogen sulfide, organic sulfur compounds such as mercaptans, and non-organic compounds such as carbon dioxide are substantially removed by liquid phase adsorption on the molecular sieve.

3,566,612
METHOD OF AGGLOMERATING FROZEN PARTICLES
Hanns Eilenberg, Rosrath, and Franz-Josef Schmitz, Weiden, Germany, assignors to Leybold-Heraeus-Verwaltung GmbH, Cologne-Bayental, Germany
Filed Apr. 25, 1969, Ser. No. 819,306
Claims priority, application Germany, Apr. 25, 1968, P 17 67 307.3
Int. Cl. C09c *1/60*; F26b *13/30*
U.S. Cl. 62—62 **4 Claims**



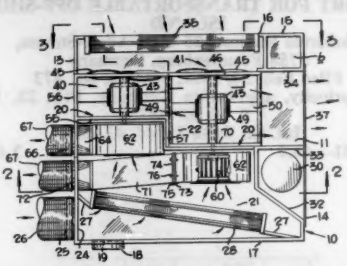
A frozen product is formed into particles of a desired size by passing it through apparatus which forms particles of the desired size while it is at a subatmospheric pressure which corresponds to the particular agglomeration temperature of the product being processed.

3,566,613
MAINTAINING VOLUME-WEIGHT RELATIONSHIP IN PACKAGING
Alfred W. Kinney, Parkville, Mo., assignor to Phillips Petroleum Company
Filed Feb. 27, 1969, Ser. No. 802,929
Int. Cl. F25c *7/14*
U.S. Cl. 62—130 **3 Claims**



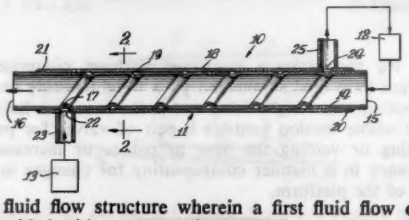
A constant volume of ice cream or similar material is positioned in each of a series of containers. The filled containers are weighed, and a signal is established which is representative of the weight of each container. In response to this signal the density of the product is adjusted so that a predetermined volume-weight relationship is maintained. This can be accomplished by adjusting air introduction to the ice cream freezer, for example.

3,566,614
AIR CONDITIONING UNIT HAVING PLURALITY OF FAN-AND-BLOWER UNITS
Sadik S. Imral, University City, Mo., assignor to Intertherm, Inc., St. Louis, Mo.
Filed Mar. 28, 1969, Ser. No. 811,407
Int. Cl. F25d *23/12*
U.S. Cl. 62—262 **4 Claims**



A low profile air conditioner unit is slidable under a mobile home, which it serves through flexible ducts. For minimum height, two fan-and-blower units are used, the blowers being staggered in plan form. Each unit is removable vertically, separately from the other, for ease in servicing.

3,566,615
HEAT EXCHANGER WITH ROLLED-IN CAPILLARY FOR REFRIGERATION APPARATUS
John Roeder, Jr., Benton Harbor, Mich., assignor to Whirlpool Corporation
Filed Apr. 3, 1969, Ser. No. 813,187
Int. Cl. F25b *41/06*
U.S. Cl. 62—511 **10 Claims**

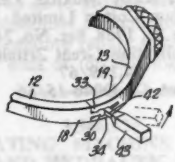


A fluid flow structure wherein a first fluid flow duct is provided with an external, outwardly opening groove. The groove is covered by an outer element which, in the illustrated embodiment, comprises an outer tube. The groove is made to be small in cross-section so as to define a capillary restrictor relative to fluid flow therethrough. The restriction of flow is adjusted by suitably deforming the outer tube overlying the groove so as to adjustably decrease the cross-section of the capillary restrictor passage. The fluid flow structure may be used in a refrigeration system for providing heat exchange between refrigerant fluid delivered from the evaporator through the first tube and refrigerant fluid delivered from a condenser to the evaporator through the capillary passage.

3,566,616
ORNAMENTAL FINGER RING HAVING A SEPARABLE CONNECTION IN ITS BAND
Robert A. Benedict, Jr., Norwalk, Conn. (R.F.D. 4, Waldoboro, Maine 04572)
Continuation-in-part of application Ser. No. 525,973, Feb. 8, 1966. This application Feb. 14, 1969, Ser. No. 799,482
Int. Cl. A44c *9/00*
U.S. Cl. 63—15.7 **3 Claims**

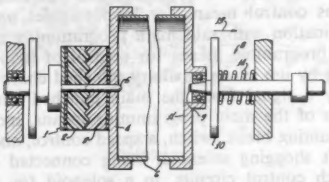
A finger ring which can be opened to facilitate placement upon and removal from a finger is constituted by hinged arcuate parts respectively carrying a plug and

socket, the latter being shaped to grip the head and reduced neck of the plug and being slotted into the arcuate part for resiliently holding the plug. The cavity is most advantageously open at inside and outside faces of the



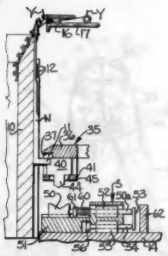
ring and the plug is shaped to extend laterally to said faces, filling them when inserted in the cavity. Effective special provision is made for ready opening of the ring by manipulation, with a simple insertable element.

3,566,617
PLOTTER DRUM MOUNTING APPARATUS
Joseph Robin Read, La Mirada, Calif., assignor to California Computer Products, Inc., Anaheim, Calif.
Filed May 1, 1969, Ser. No. 820,914
Int. Cl. F16d *3/64*
U.S. Cl. 64—14 **1 Claim**



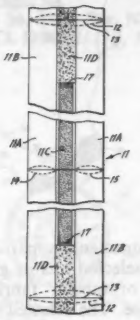
Complementary grooved resistent surfaces may be used to effect quiet non-backlash torque between a drum and drive assembly. The contact pressure between the surfaces may be maintained by a spring which may be compressed to facilitate the drum removal or installation.

3,566,618
INDIVIDUAL NEEDLE CONTROL MEANS FOR CIRCULAR WARP KNITTING MACHINES
Robert E. Merritt, Mount Airy, N.C., assignor to Renfro Hosiery Mills Company, Mount Airy, N.C.
Filed Oct. 13, 1969, Ser. No. 865,703
Int. Cl. D04b *25/02*
U.S. Cl. 66—8 **8 Claims**



The needles are selectively positioned at knit, tuck or float levels in accordance with a predetermined pattern to provide various patterns in the knit fabric. The control means is operable upon the butts of the needles to selectively vary the height to which individual needles are raised by a needle actuating ring surrounding the needle cylinder. The control means includes stepped slides supported for radial movement in the needle operating ring and beneath the butts of the needles. Cam slides are positioned beneath and in alignment with the stepped slides for properly positioning the stepped slides when the needle actuating ring is lowered.

3,566,619
MACHINE KNITTING
Seymour C. Titone, Birchrunville, Pa., assignor to Titone Research & Development Corporation, Burlington, N.J.
Filed Feb. 14, 1968, Ser. No. 705,377
Int. Cl. D04b *23/02*
U.S. Cl. 66—87 **7 Claims**



Tubular fabric is warp-knitted to have a plurality of narrow tubular portions located side-by-side but spaced apart and joined endwise to a single wide tubular portion. Knit articles so formed, comprising a pair of spaced narrow tubes joined endwise to a wide tube, are useful for garments in which the wide tubular portion surrounds the trunk or body, and the narrow tubular portions surround the limbs, e.g., panty hose and panty girdles.

3,566,620
METHOD OF FORMING KNITTED FABRIC
Herbert E. Haehnel, Reading, Pa., assignor to North American Rockwell Corporation, Pittsburgh, Pa.
Continuation-in-part of application Ser. No. 552,334, May 23, 1966. This application July 22, 1966, Ser. No. 567,128
Int. Cl. D04b *15/04*
U.S. Cl. 66—96 **9 Claims**

Method of forming design stitches in courses of a flat knitted fabric by individually transferring the stitches in groups of wales in opposite directions from the wales in which the stitches are originally formed to other wales in the groups.

3,566,621

ARRANGEMENT FOR POSITIVE YARN TENSION CONTROL ON DOUBLE ROW WARP KNITTING MACHINE

Marius Antoine Perrier, Lyon, France, assignor to Somarco S.A., Fribourg, Switzerland

Filed July 14, 1969, Ser. No. 841,192
Claims priority, application Germany, July 13, 1968, P 17 60 879.6
Int. Cl. D04b *23/02*
U.S. Cl. 66—87 5 Claims

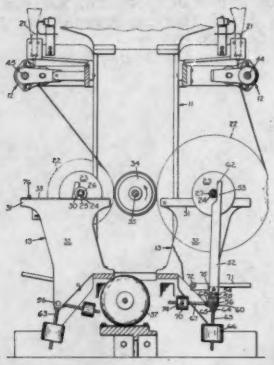
The present arrangement is particularly adapted for varying the feed of selected sets or groups of warp yarns during the knitting of tubular fabric on a double row warp knitting machine. The selected variation in the feed rate of the warp yarns is particularly adapted for knitting tubular hosiery blanks wherein a different stitch pattern is employed in knitting the reinforced and plain knit sections of the hosiery blank.

3,566,622

APPARATUS FOR FORMING A ROLL OF FABRIC CONTINUOUSLY WITH THE KNITTING THEREOF

Vincent A. Iannucci, Lincoln Park, and Ronald S. Schartel, Whitfield, Pa., assignors to North American Rockwell Corporation, Pittsburgh, Pa.

Filed Dec. 16, 1968, Ser. No. 783,992
Int. Cl. D04b *15/88*
U.S. Cl. 66—151 5 Claims



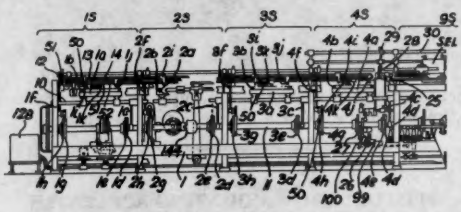
Mechanism for winding a flattened knitted tube, as it is delivered by the knitting machine, into a roll of substantially uniform density, the mechanism including a driving roll, a shafted core on which the fabric is wound, rollers mounted for rotation on the ends of the core shaft, substantially horizontal rails for supporting the rollers for movement therealong and means to maintain a surface layer of fabric on the core against the driving roll with a substantially uniform pressure as the layers of fabric build up on the core.

3,566,623

PROGRAMMING CONTROL SYSTEM FOR STRAIGHT BAR AND FLAT BED KNITTING MACHINES

Raymond Blood, Shepshed, Loughborough, and Rae Lawrence Duthie, Kirby Muxloe, Leicester, England, assignors to William Cotton Limited

Filed July 22, 1968, Ser. No. 746,381
Claims priority, application Great Britain, July 25, 1967, 34,109/67
Int. Cl. D04b *15/66*
U.S. Cl. 66—154 9 Claims



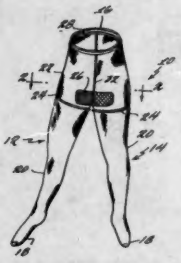
In a straight bar or flat bed knitting machine adapted for programme control of selvedge fashioning by use of a main punched chart programming means such as disclosed in U.S. Pat. No. 3,141,316 and not including in this means control means for loop transfer patterning, the combination with said main programming means of auxiliary programme means for control of loop transfer patterning by use of an auxiliary punched chart which is started by a signal from the main punched chart, relevant parts of the main programming means, including a course counting break switch, a speed control, and a main cam shaft shogging solenoid, being connected by relay and switch control circuits, to a solenoid for propping out selvege racking mechanism when patterning is required, pattern selection control mechanism, and solenoids for control of racking of an auxiliary or pattern punched chart which operates the pattern selection control mechanism for patterning and which is self-stopping, so that patterning can be changed without changing fashioning and vice versa.

3,566,624

PANTY HOSE WITH LOOSENED STITCH CROTCH AREA

Aaron Burleson, Burlington, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Aug. 2, 1968, Ser. No. 749,866
Int. Cl. D04b *9/02*
U.S. Cl. 66—177 10 Claims



A panty hose garment construction of the type wherein a pair of circularly knit stocking tubes, each having a foot, leg and upper portion with the upper portion longitudinally slit intermediate the front and rear portions thereof are seamed together along the slits with the latter face open and facing each other to provide a panty hose

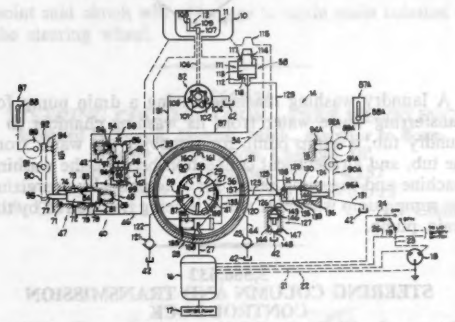
garment. A loosened stitch area is knitted in each stocking part during its formation and is contained within a predetermined multiplicity of courses extending above and below the lower end of the slit and a predetermined multiplicity of wales extending to the rear and to the front of the slit, so as to provide adequate fit characteristics with no substantial concentration of strain at the seam to cause premature failure at the point thereon securing the lower ends of the slits together.

3,566,625

FABRIC TREATING MACHINE WITH ROTARY AGITATOR AND HYDRAULIC TRANSMISSION

Herbert A. McAninch, Auburn, Ind., and Herbert N. Underwood, Chicago, Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed June 30, 1969, Ser. No. 837,804
Int. Cl. D06f *29/00*; F16d *33/00*
U.S. Cl. 68—23.7 **21 Claims**



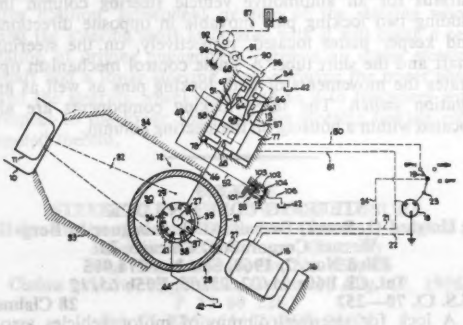
A fabric treating machine having a tub, a rotatable fabric container and a rotary agitator such as, for example, of the off-set shaft or bent shaft type and a hydraulic transmission for rotating the agitator for a washing operation and for rotating the container for an extract-spin operation.

3,566,626

HYDRAULIC TRANSMISSION FOR TUMBLE-TYPE FABRIC-TREATING MACHINES

Herbert A. McAninch, Auburn, Ind., and Herbert N. Underwood, Chicago, Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed June 30, 1969, Ser. No. 837,821
Int. Cl. D06f *29/02*; F16d *31/08*
U.S. Cl. 68—23.7 **7 Claims**



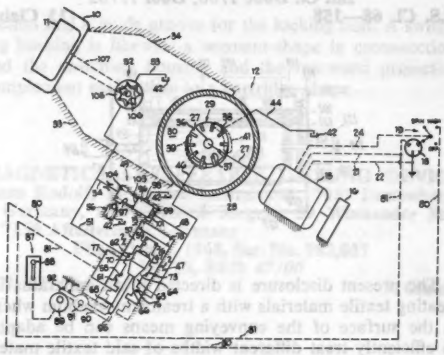
A fabric treating machine of the tumble-type, including a fabric container disposed at an angle to the vertical and a hydraulic transmission for driving the fabric container. The fabric container is connected to the pump housing element and dual range flow restricting means restrict the pump output in either a low speed or high speed setting to induce rotation of the pump housing element and the clothes container attached thereto. Speed control means are incorporated in the transmission and operate to selectively vary the container speed within predetermined limits for both low and high speed settings.

3,566,627

HYDRAULIC TRANSMISSION FOR TUMBLE-TYPE FABRIC TREATING MACHINES

Herbert A. McAninch, Auburn, Ind., and Herbert N. Underwood, Chicago, Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed June 30, 1969, Ser. No. 837,702
Int. Cl. D06f *21/10, 37/36*
U.S. Cl. 68—24 **4 Claims**



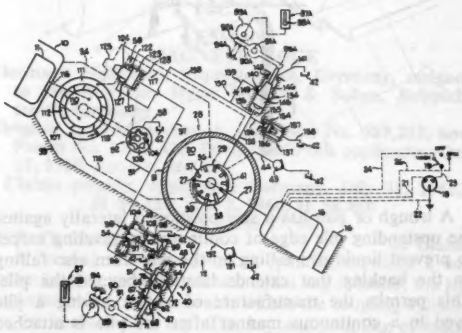
A fabric treating machine of the tumble-type, including a fabric container disposed at an angle to the vertical and a hydraulic transmission drivingly connected to the fabric container. Speed control means and dual range flow control means are incorporated in the transmission and operate to selectively vary the container speed within predetermined settings for both a low speed "tumble" range of operation and high speed centrifugal-extraction range of operation.

3,566,628

HYDRAULIC TRANSMISSION FOR TUMBLE-TYPE FABRIC-TREATING MACHINE

Herbert A. McAninch, Auburn, Ind., and Herbert N. Underwood, Chicago, Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

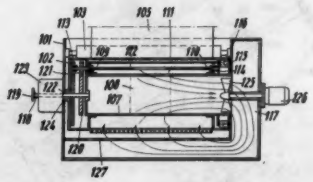
Filed June 30, 1969, Ser. No. 837,805
Int. Cl. D06f *23/06*; F16d *31/06*
U.S. Cl. 68—24 **8 Claims**



A fabric-treating machine of the tumble-type including a fabric container disposed at an angle to the vertical and

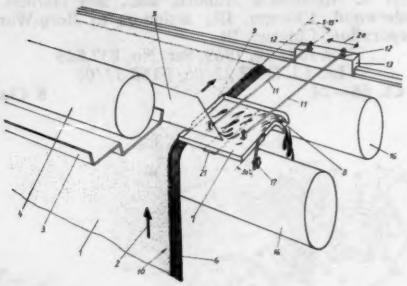
a hydraulic transmission for driving the fabric container. The hydraulic transmission includes a reversible positive displacement hydraulic pump operable in one direction of rotation to drive a hydraulic motor which in turn rotates the fabric container for a relatively low speed tumble or washing operation, the pump being operative in another direction of rotation to rotate the fabric container through the pump housing element for a relatively high speed centrifugal extraction operation.

3,566,629
APPARATUS FOR THE TREATMENT OF PERMEABLE MATERIAL
Heinz Fleissner, Egelsbach, near Frankfurt am Main, Germany, assignor to Vepa AG, Basel, Switzerland
Filed Feb. 10, 1969, Ser. No. 798,073
Claims priority, application Germany, Jan. 7, 1969, P 19 00 496.7; Feb. 10, 1968, P 17 10 480.2
Int. Cl. D06c *1/06;* **D06f** *17/02*
U.S. Cl. 68—158 **13 Claims**



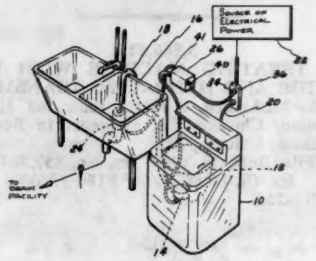
The present disclosure is directed to an apparatus for treating textile materials with a treatment medium wherein the surface of the conveying means can be adapted to efficiently treat different widths of said textile materials. The present apparatus is effective for both liquid and gas treatment mediums.

3,566,630
CONTINUOUS CARPET DYEING DEVICE
Valentin Appenzeller, Am Hagelkreuz 13, Kempen, Germany
Filed Dec. 19, 1968, Ser. No. 785,203
Claims priority, application Germany, Dec. 23, 1967, P 16 35 013.3
Int. Cl. B05b *13/02;* **D06f** *35/00*
U.S. Cl. 68—205 **4 Claims**



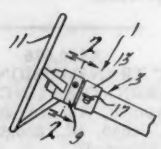
A trough or pan has a side positioned laterally against the upstanding pile edge of continuously traveling carpet to prevent liquid dye falling on the pile from also falling on the backing that extends laterally beyond the pile. This permits the manufacture of carpet having a pile dyed in a continuous manner after the pile is attached to the backing, without the backing being dyed inadvertently where it extends laterally beyond the pile.

3,566,631
WASHING MACHINE WITH SUMP PUMP CONNECTION
Eugene A. Willis, 5832 Lobdell Road, Mayville, Mich. 48744
Filed Nov. 14, 1968, Ser. No. 775,611
Int. Cl. D06f *39/00*
U.S. Cl. 68—208 **6 Claims**



A laundry washing machine having a drain pump for transferring waste water from its washing chamber to a laundry tub, a sump pump for removing the water from the tub, and an electrical connection between the washing machine and the sump pump for automatically energizing the sump pump whenever water is being transferred by the drain pump.

3,566,632
STEERING COLUMN AND TRANSMISSION CONTROL LOCK
Thomas J. Wall, Southfield, and Harry E. Wilcox, Livonia, Mich., assignors to Chrysler Corporation, Highland Park, Mich.
Filed May 17, 1968, Ser. No. 729,965
Int. Cl. B60r *25/02, 25/06;* **F05b**
U.S. Cl. 70—248 **7 Claims**

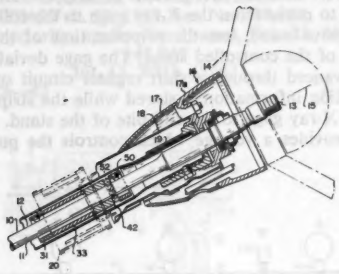


Improved steering, transmission and ignition lock apparatus for an automotive vehicle steering column including two locking pins movable in opposite directions and keeper plates located, respectively, on the steering shaft and the shift tube. A single control mechanism operates the movements of both locking pins as well as an ignition switch. The three locking components are all located within a housing on the steering column.

3,566,633
STEERING COLUMN LOCK
Howard O. Borck, Detroit, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Nov. 7, 1968, Ser. No. 774,005
Int. Cl. B60r *25/02, 25/06;* **E05b** *65/12*
U.S. Cl. 70—252 **28 Claims**

A lock for steering columns of motor vehicles associated with an ignition switch which lock engages a torque limiting clutch providing a strong torque resistance to turning the steering wheel. When a predetermined value of torque has been exceeded the elements of the torque

limiting clutch will dissociate allowing rotation of the steering wheel through a predetermined arc at which point said clutch will re-engage to again resist rotation of the steering wheel.

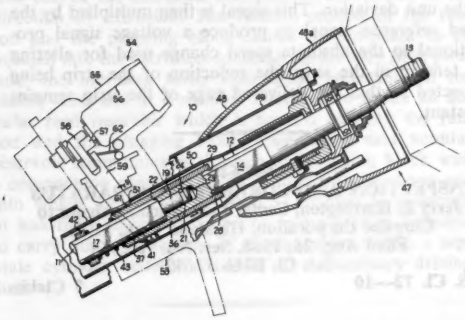


3,566,634

STEERING COLUMN LOCK—FREE WHEELING

Howard O. Borck, Detroit, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 7, 1968, Ser. No. 774,157
Int. Cl. B60r *25/02, 25/06;* E05b *65/12*
U.S. Cl. 70—252 17 Claims



An anti-theft device for motor vehicles associated with the steering column and the ignition switch such that by placing the ignition switch in a predetermined inoperative position, subsequent rotation of the steering wheel and the steering shaft associated with it will cause a cessation of driving engagement between an upper steering shaft and a lower steering shaft allowing the upper shaft and the steering wheel connected to it to freewheel with respect to the lower shaft and the steering linkage connected thereto.

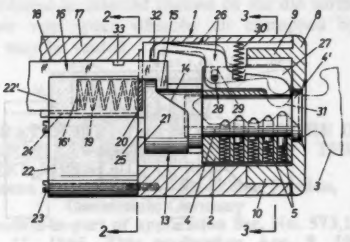
3,566,635

STEERING WHEEL SPINDLE CLOSURE

Heinz Wolter, Cologne-Lindenthal, Germany, assignor to Josef Vose KG, Cologne, Germany

Filed Aug. 14, 1969, Ser. No. 850,053
Claims priority, application Germany, Aug. 17, 1968, P 17 80 228.7
Int. Cl. E05b *65/12;* B60r *25/02*
U.S. Cl. 70—252 5 Claims

A steering wheel spindle lock equipped with a lock cylinder and a key operated switch, particularly for automotive vehicles, which comprises a cartridge-shaped housing and a lock cylinder. A locking bolt is displaceable in axial direction of the housing and both, the lock cylinder and the locking bolt, are disposed in the housing. The latter has a rearward projection of segment-shape in cross-section and a guide groove for the locking bolt. A switching housing is likewise a segment-shape in cross-section, and the switching housing and the rearward projection complement each other to a cartridge shape.

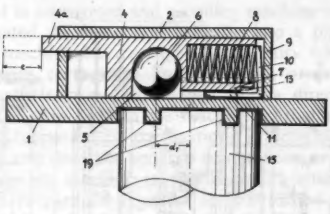


3,566,636

MAGNETICALLY OPERABLE LOCKING DEVICE

Hans Rudolf, 11 August-Lammle-Str., 7057 Leutenbach, Germany, and Gerhard Riegraf, 59 Winnender Str., 7150 Affalterbach, Germany

Filed Dec. 9, 1968, Ser. No. 782,037
Int. Cl. E05b *47/00*
U.S. Cl. 70—276 9 Claims



A magnetically operable locking device having latching means in a housing, a spring loaded detent means of magnetically influenced material and magnetic means for releasing the detent. The magnetic means exerts a magnetic field force large enough to include a magnetizable roller, the length of the force being only slightly larger than the distance required to move the latch to an unlocked position.

3,566,637

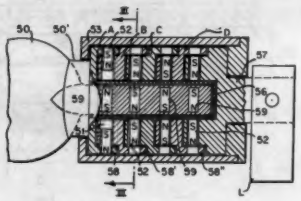
MAGNETIC LOCK

Hermann Hallmann, Ruppichteroth, Germany, assignor to Huwil-Werke, Hugo Willach & Sohne, Ruppichteroth, Germany

Original application Aug. 1, 1966, Ser. No. 569,212, now Patent No. 3,495,425. Divided and this application Oct. 17, 1969, Ser. No. 867,186
Claims priority, application Germany, July 31, 1965, H 56,738; Feb. 3, 1966, H 58,460
Int. Cl. E05b *47/00*
U.S. Cl. 70—276 20 Claims

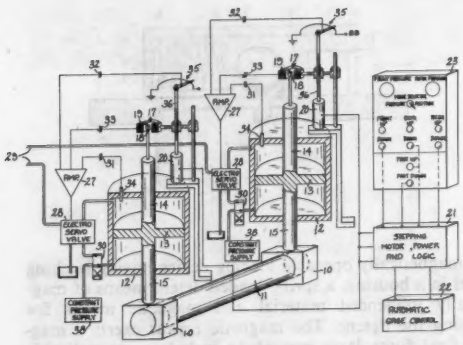
A housing retains a coupling cylinder, to which a bail or locking element is attached, and a key cylinder, the key cylinder being freely movable within the coupling cylinder in the absence of a key. The key and coupling cylinders are formed with at least a pair of matching chambers receiving magnetic elements, one of the chambers being large enough to wholly accommodate the magnetic ele-

ment so that the key cylinder may spin freely when the key is absent, or of the wrong combination. The magnetic properties of the proper key cause the elements to move for example by repulsion, into a position spanning the



chambers of key cylinder and coupling cylinder to couple the key through the coupling cylinder to the locking element so that operating forces can be transmitted from key to locking element only upon presence of the proper key.

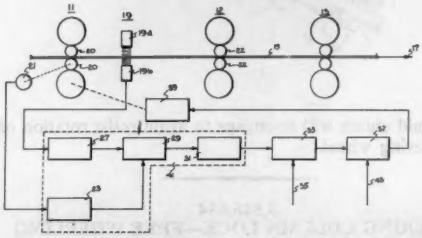
3,566,638
SCREWDOWN SYSTEM FOR A ROLLING MILL
Robert Herbst, Cheshire, Conn., assignor to Textron, Inc., Providence, R.I.
Filed May 29, 1968, Ser. No. 732,999
Int. Cl. B21b *37/08, 37/12*
U.S. Cl. 72—8 **6 Claims**



A hydraulic screwdown system for a rolling mill. In particular, there is provided a double-acting hydraulic cylinder having its piston position to effect mill adjustment in accordance with a control signal. In one embodiment a displacement transducer is utilized to generate the control signal and in another of the embodiments, a pressure transducer is utilized in generating control signals.

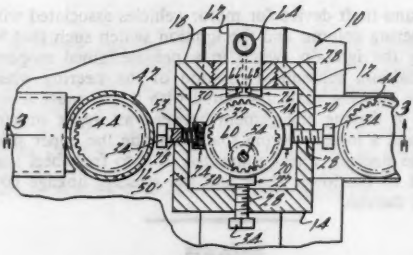
3,566,639
GAGE CONTROL FOR MULTISTAND ROLLING MILL
Paul E. Dornbusch, Roanoke, Va., assignor to General Electric Company
Filed Nov. 21, 1968, Ser. No. 777,569
Int. Cl. B21b *37/02*
U.S. Cl. 72—8 **4 Claims**

An apparatus for controlling the gage of a metal strip from one stand of a multistand rolling mill having at least two stands by controlling the speed of one of the stands in response to a signal from an X-ray gage, positioned between these stands, which represents deviation from expected gage, delayed for a period of time equal to the transport time for that portion of strip containing the deviation to move from the X-ray gage to the roll bite of the successive stand, less the response time of the speed regulator of the controlled stand. The gage deviation signal is advanced through a shift register circuit such that the deviation information is stored while the strip travels from the X-ray gage to the roll bite of the stand. A tachometer provides a voltage which controls the pulse rate



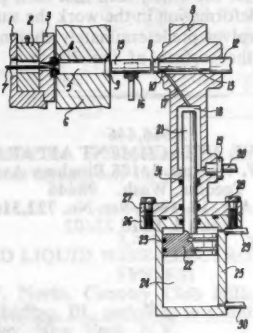
of the shifting pulses such that the pulse rate is proportional to the output of the tachometer, or speed of the strip. The gage deviation signal after having been delayed is divided by the gage reference, or expected gage, signal for producing a current signal which is proportional to the unit deviation. This signal is then multiplied by the speed reference signal to produce a voltage signal proportional to the absolute speed change used for altering the tension in the strip, the reduction of the strip being corrected so that the delivered gage of the strip remains constant.

3,566,640
INSPECTION AND CORRECTION APPARATUS
Jerry E. Harrington, Center Line, Mich., assignor to Chrysler Corporation, Highland Park, Mich.
Filed Aug. 26, 1968, Ser. No. 755,355
Int. Cl. B21b *37/00*
U.S. Cl. 72—10 **7 Claims**



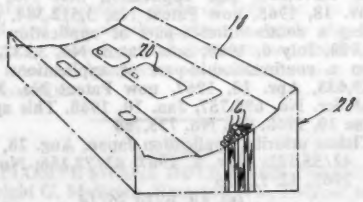
A machine for detecting and correcting dimensional irregularities of curved surfaces such as piston rings, gears, bearings and the like. The workpiece being inspected is rotated within a set of jaws and a sensor is positioned adjacent the workpiece which is capable of generating an output signal in response to an out of round condition. This signal results in the actuation of one of the jaw members which is capable of compressing the workpiece to thereby eliminate the high point.

3,566,641
PLUGGING DEVICE FOR EXTRUSION CONTAINER
Charles Sauve, 9 Bis Avenue Jean Jaures, Versailles, Yvelines, France
Filed Feb. 10, 1969, Ser. No. 798,001
Claims priority, application France, Feb. 22, 1968, 140,940
Int. Cl. B21b *45/02*
U.S. Cl. 72—43 4 Claims



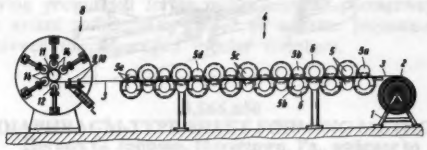
A device for plugging extrusion containers and comprising a die, a cylindrical die cavity containing the billet to be extruded and an extrusion ram associated with a slidable plugging block which is adapted to close off the rear end of the extrusion container as considered in the direction of extrusion. The relative motion of the ram rod and the plugging block causes the lubricant to be injected into the extrusion container under very high pressure, the lubricant being maintained preferably in the plastic state and at a suitable temperature inside an annular feed reservoir which is formed between the ram rod and the plugging block. Essentially, said annular reservoir communicates through the plugging block with a compression chamber which is filled with lubricant and into which the rod of a piston is adapted to penetrate in leak-tight manner, said piston being in turn intended to carry out a movement of displacement within a separate cylinder under the action of an auxiliary driving fluid.

3,566,642
HEXAGONAL ROD DIE CONSTRUCTION HAVING AN INHERENT DIE SURFACE LUBRICATION SYSTEM
Foster E. Whitacre, Farmington, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Sept. 18, 1968, Ser. No. 760,642
Int. Cl. B21d *37/18*
U.S. Cl. 72—44 5 Claims



A die construction comprising incremental rods arranged in registry, the ends of the rods forming incremental die surface areas, said rods being machined individually prior to assembly with a predetermined length and with end surfaces having surface normals situated in precalibrated directions, the machining procedure including the removal of metal from selected rods to provide fluid flow passages which communicate either with a lubrication supply manifold whereby lubricant is selectively distributed to selected regions of the die surface or with an air vent space whereby air entrapped by the workpiece may be vented.

3,566,643
APPARATUS FOR THE MANUFACTURE OF HELICALLY COILED PIPES OF THIN SHEET METAL
Lorenz Westerbarkey, Zum Stillen Frieden, Guetersloh, Germany
Continuation-in-part of application Ser. No. 573,110, Aug. 17, 1966. This application Apr. 9, 1969, Ser. No. 814,695
Int. Cl. B21c *37/12*
U.S. Cl. 72—49 11 Claims

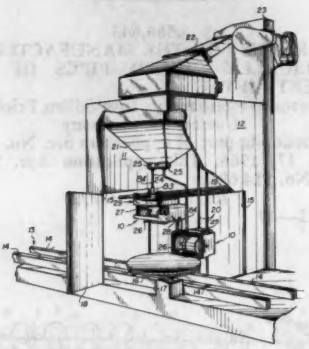


An apparatus for the manufacture of corrugated, helically coiled and wound pipes of thin sheet metal or metal foil includes a multi-roll machine in which a strip of sheet metal is corrugated and a coiling machine in which the corrugated strip is coiled helically into a pipe. The multi-roll machine has corrugated roll pairs which are provided with corrugating grooves which progressively and gradually narrow and deepen in the direction of travel of the strip through the machine so that the strip during the formation of corrugations is deformed only by bending and does not undergo compression or stretching. The coiling machine is provided with entry guide rolls which prepare the edges of the corrugated strip by slightly bending the edge corrugations without compression or stretching deformation. Thus while the corrugated strip is being coiled on a coiling mandrel of the coiling machine, the downwardly open corrugation at the edge of the uppermost convolution of the strip engages in the upwardly open corrugation of the adjacent lowermost convolution of the strip. These interengaging corrugations are held together by compression by rolls on the coiling machine acting against the mandrel to form a joint. The joint is subjected to pressure by an additional roll located beyond the mandrel in the direction of movement of the strip to lock the corrugations securely together.

3,566,644
APPARATUS FOR SURFACE TREATING WORK PIECES
Ralph W. Moore, Hagerstown, Md., assignor to Metal Improvement Company (N.J.)
Filed Feb. 6, 1969, Ser. No. 797,090
Int. Cl. C21d *7/06*
U.S. Cl. 72—53 20 Claims

The apparatus for the surface treating of work pieces comprises a motor and a centrifugal throwing wheel connected for rotation to the motor, the throwing wheel having an axially arranged feed inlet for receiving peening particles to be projected into impingement with the work piece to be treated. A frame is provided to pivotally support the motor and throwing wheel about a first axis which

is substantially coincident with the axis of rotation of the throwing wheel. A base member is pivotally connected to the frame for supporting the latter for movement about a second axis substantially normal to the axis of the throwing wheel. A peening particle supply conduit is disposed to communicate with a supply of peening particles and the feed inlet for delivering peening particles to the



throwing wheel. The supply conduit is constructed and arranged so that portions of its longitudinal axie lie coincident with said first and second axes. A remote controlled indexing means is connected to coact with the frame, throwing wheel and motor to rotate the motor and throwing wheel about the first and second axes to thereby effect adjustment of the throwing wheel in a multiplicity of positions relative to the work piece to be treated.

3,566,645

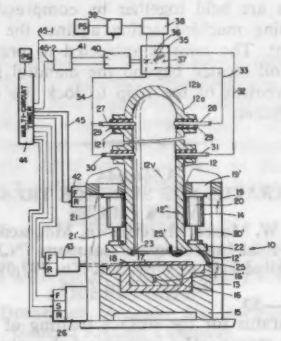
METHOD AND APPARATUS FOR PRESSURE WORKING MATERIALS

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of applications Ser. No. 668,561, June 27, 1957, and Ser. No. 501,395, Oct. 22, 1965, now Patent No. 3,371,404. This application Mar. 5, 1968, Ser. No. 710,518

Int. Cl. B21d *26/06*

U.S. Cl. 72—56 **9 Claims**



A method and apparatus are provided for forming material such as sheets and plates by means of intense pressure developed in a working fluid. A die and pressure chamber are brought together with the work disposed between the two and restrained from movement by clamping engagement during the movement of the die and chamber. Thereafter, one or more intense pressure waves such as shock waves are generated in the working fluid in the chamber and are operative to cause the work to predeterminately deform against the die. The work may be deformed as the result of a single pulse of intense pressure within the working fluid or by generating a plurality of pulses, one after the other, such that each pulse causes an incremental deformation in the work the sum of which deformations involves predeterminately shaping the work to conform to the surface of the die in a progressive manner.

3,566,646

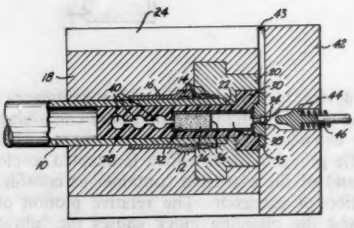
EXPLOSIVE ATTACHMENT APPARATUS

Richard W. Walkup, 14108 Bingham Ave. E., Tacoma, Wash. 98446

Filed Apr. 18, 1968, Ser. No. 722,310

Int. Cl. B21d *25/02*

U.S. Cl. 72—56 **1 Claim**



An apparatus for swaging a metal tube to a fitting by explosive attachment comprising an elastomeric member containing an explosive charge which is inserted into the tube. Upon detonation of the explosive charge, shock forces are transferred by the elastomer to the tube wall, swaging the tube to the fitting. An interior cavity in the elastomeric member relieves peak shock forces and entraps contaminants from the detonation.

3,566,647

HYDROIMPACT, HIGH ENERGY-RATE FORMING OF PLASTICALLY DEFORMABLE BODIES

Kiyoshi Inoue, Tokyo, Japan (100 Sakato, Kawasaki, Kanagawa, Japan)

Continuation-in-part of application Ser. No. 574,056, Aug. 22, 1966, which is a continuation-in-part of application Ser. No. 311,061, Sept. 24, 1963, now Patent No. 3,276,558, and application Ser. No. 508,487, Nov. 18, 1965, now Patent No. 3,512,384, the latter being a continuation-in-part of application Ser. No. 41,080, July 6, 1960, now Patent No. 3,232,085, and also a continuation-in-part of applications Ser. No. 629,633, Apr. 10, 1967, now Patent No. 3,461,268, and Ser. No. 696,757, Jan. 10, 1968. This application June 10, 1968, Ser. No. 735,760

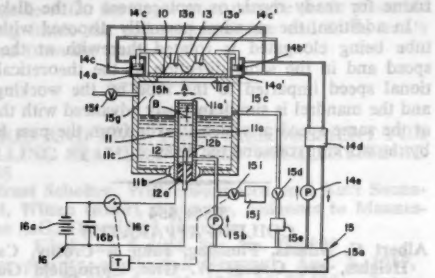
Claims priority, application Japan, Aug. 28, 1967, 42/55,102; Nov. 9, 1967, 42/72,156; Nov. 10, 1967, 42/72,315

Int. Cl. B21d *26/14*

U.S. Cl. 72—56 **18 Claims**

A hydroimpact-forming system in which a column of liquid in a barrel of a shock-forming gun is trained upon the workpiece and electric discharge is effected in the column to propel the column against the workpiece and produce a shock wave superimposed on the gross move-

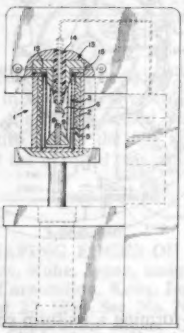
ment of the liquid to shape the workpiece. The liquid is preferably directed at the workpiece in a jet with a velocity of 100–10,000 m./second with the discharge being superimposed impulsively on this jet.



3,566,648
PULSED LIQUID WIRE-ELECTROHYDRAULIC SYSTEM

Robert W. Norin, Country Club Hills, and Donald J. Roth, Chicago, Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Filed Sept. 25, 1968, Ser. No. 762,457
Int. Cl. B21d *26/08*
U.S. Cl. 72—56 19 Claims



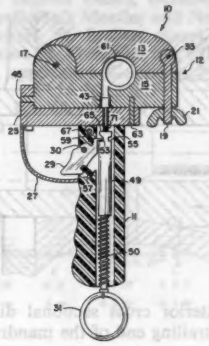
An electrohydraulic container forming device wherein a thin stream of conductive fluid constitutes a bridge between one electrode and the other of the shock producing electrodes. The conductive liquid is pressurized to a higher value than the internal pressure of the container. In operation the conductive liquid is emitted under pressure from one electrode by a timing circuit driving a shear type solenoid valve. A second timing circuit synchronizes the electrical discharge with the establishment of a preferentially conductive bridge across the electrode gap. A sharp jet pulse is given off from the arc thus established and this develops pressure inside the rubber diaphragm to press it against the container which is then pressed into the interstices of the die to give a fully stylized container.

3,566,649
EXPLOSIVE SWAGE DEVICE FOR TUBING

Dwight G. McSmith, Hampton, Va., assignor to Ideas, Incorporated, Newport News, Va.

Filed Jan. 6, 1969, Ser. No. 789,268
Int. Cl. B21d *26/08*
U.S. Cl. 72—56 6 Claims

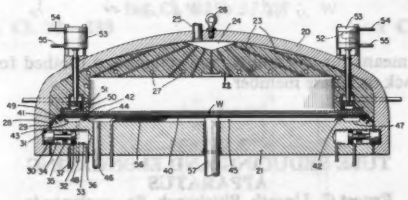
A hand tool for explosively connecting telescoped tubular members wherein the telescoped members are positioned within a supporting structure having an annular passageway therein surrounding and in fluid connection with the telescoped tubular members and means for applying pressurized forces in the annular passageway of an extent sufficient to induce an annular pressure-weld between the telescoped tubular members.



3,566,650
DIAPHRAGM-TYPE SHEET FORMING METHOD

Herbert G. Johnson, Havertown, Pa., assignor to Shell Oil Company, New York, N.Y.

Continuation-in-part of application Ser. No. 660,491, Aug. 14, 1967. This application Apr. 10, 1969, Ser. No. 815,127
Int. Cl. B21d *22/12*
U.S. Cl. 72—63 8 Claims



This application discloses diaphragm-type sheet forming apparatus and method for forming sheet blank workpiece material, especially plastic material, by such apparatus. The apparatus comprises a rigid die and an elastomeric diaphragm which is forced by fluid pressure into the die against a sheet workpiece blank to force the blank against the die to form a shaped article.

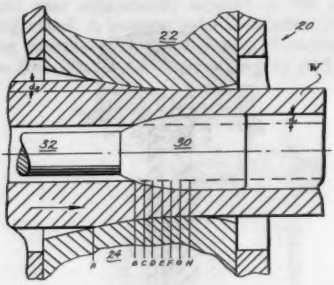
3,566,651
METHOD AND APPARATUS FOR FORMING INTERNALLY PROFILED TUBULAR PARTS BY MATERIAL DISPLACEMENT

Erich Tlaker, Springfield, Vt., assignor to Fellows Gear Shaper Company, Springfield, Vt.

Filed Oct. 3, 1968, Ser. No. 764,896
Int. Cl. B21c *37/20*
U.S. Cl. 72—76 7 Claims

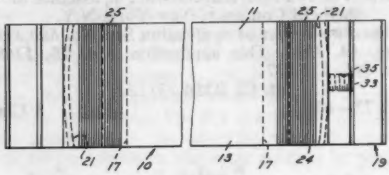
A method and device for forming tubular parts by material displacement wherein a hollow workpiece blank is fed past a tapered mandrel positioned within the blank and intermediate the deforming areas of dies. The mandrel is tapered from its trailing to its leading end and the mandrel's largest cross sectional dimensions are greater than the internal cross sectional dimensions of the workpiece blank whereby the deformation of the workpiece blank about the mandrel by the dies gradually reduces the exterior dimensions and gradually increases the interior

dimensions of the workpiece blank until the internal cross sectional dimensions of the workpiece blank con-



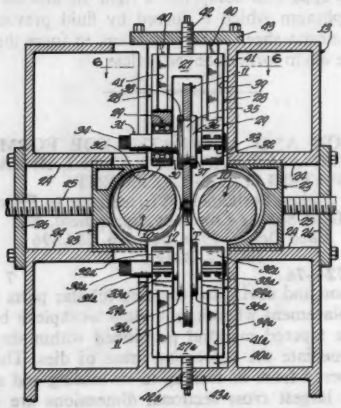
form to the exterior cross sectional dimensions of the mandrel at the trailing end of the mandrel.

3,566,652
METHOD AND APPARATUS FOR PROVIDING A TOOTHED-FORMING RACK
Willard B. McCardell, Royal Oak, Mich., assignor to Michigan Tool Company, Detroit, Mich.
Filed Aug. 23, 1968, Ser. No. 754,880
Int. Cl. B21h *3/06*
U.S. Cl. 72—88 **1 Claim**



A means for assembling and retaining a toothed forming rack on a base member.

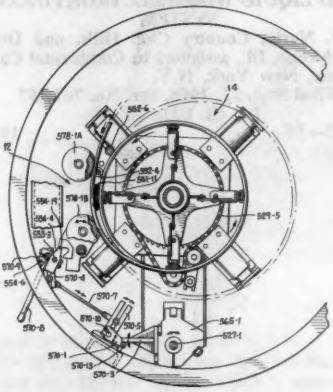
3,566,653
TUBE REDUCING AND ELONGATING APPARATUS
Ernest G. Unrath, Pittsburgh, Pa., assignor to Wean Industries, Inc., Youngstown, Ohio
Filed Nov. 15, 1968, Ser. No. 776,124
Int. Cl. B21b *19/06, 31/12*
U.S. Cl. 72—96 **11 Claims**



Tube reducing and elongating apparatus of the "Diescher" type having a main frame rotatably supporting opposed, barrel-shaped, tube working rolls which form a pass for the tube and having opposed, tube-confining disks at the working roll pass rotatably mounted in respective sub-frames which are easily removable from the main frame for ready repair or replacement of the disks.

In addition, the mandrel normally disposed within the tube being elongated is rotated therewith at the same speed and in the same direction as the theoretical rotational speed imparted to the tube by the working rolls and the mandrel is simultaneously advanced with the tube at the same speed at which it exits from the pass formed by the working rolls and the disks.

3,566,654
COILING APPARATUS
Albert C. Adams, Flushing, John J. Crosby, Cambria Heights, and George W. Graf, Springfield Gardens, N.Y., assignors to Republic Steel Corporation, Cleveland, Ohio
Filed Feb. 20, 1968, Ser. No. 706,850
Int. Cl. B21d *11/06*
U.S. Cl. 72—135 **21 Claims**



Apparatus for forming a uniform coil of strip material such as tubing. A bending station bends the strip (supplied continuously thereto) to a desired radius. A plurality of relatively small diameter bending rolls are employed midway between and on the opposite side of the strip from two bending rolls of larger diameter. The strip passes from the bending rolls to a spool which is reciprocated past the plane of the bending station to wrap successive turns and layers of a coil on the spool as the spool is rotated. The reciprocating movement of the spool may be intermittent, i.e., in discrete steps, and may be given a measured delay at the top and bottom positions of the spool to position the turns of each layer opposite the adjacent turns of the next inside layer on the coil. The axis of the spool is movable toward and away from the bending station, and one of the bending rolls is adjustable in accordance with the movement of the spool axis away from the bending station as a coil is built up on the spool so as to automatically increase the radius of bending as the coil diameter increases. An hydraulic valving mechanism is employed having concentric sleeves which include passages therein which when aligned pass fluid therethrough to communicate the cylinder with a fluid supply and discharge system. One of the sleeves is actuated as the strip is coiled on the spool, while the other sleeve is actuated by the reciprocating movement of the spool. The passages in the sleeves are thus intermittently aligned and then nonaligned so as to provide for the intermittent communication of the cylinder through the sleeves with

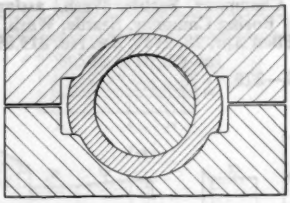
the fluid supply and discharge system. Guide rolls may be employed to support the strip, including rolls adjacent the spool to contain the coil formed on the spool. Of these latter guide rolls, the upper ones may be made pivotable to swing inside the coil to permit the coil to be easily removed from the spool.

3,566,655

METHOD AND ROLL PASS ARRANGEMENT FOR ROLLING SEAMLESS TUBES WITH EXTERNAL FINS

Karl Ernst Scholten, Witten-Bommern, and Kurt Sonnabend, Witten (Ruhr), Germany, assignors to Mannesmann A.G., Dusseldorf, Germany

Filed Aug. 5, 1968, Ser. No. 750,239
Claims priority, application Germany, Aug. 3, 1967, M 75,032; Aug. 11, 1967, M 75,115
Int. Cl. B21b *17/10*
U.S. Cl. 72—209 3 Claims



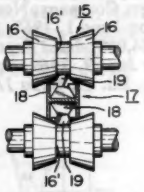
A seamless finned tube is produced from a bloom by cold pilger rolling in two successive roll groove sections; in the first section the tube is rolled down to final wall thickness, and in the second the fins are rolled to final size. The lengths of the unrolled two section grooves have a ratio of 3:1.

3,566,656

DEVICE FOR SHAPING EDGES OF SHAPE STEEL

Tomomi Matsumuro, Kobe, Japan, assignor to Kawasaki Steel Corporation, Kobe, Japan

Filed Sept. 23, 1968, Ser. No. 761,411
Claims priority, application Japan, Oct. 16, 1967, 42/66,179
Int. Cl. B21b *39/16*
U.S. Cl. 72—227 6 Claims



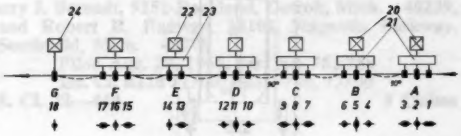
A device for edging shape steel having a web and flanges, comprising a pair of rolls, a guide member means, and a fixed supporting means for the guide member means. The guide member means has a cross section at a plane passing the axes of the rolls, and the configuration of the cross section of the guide member means is complementary with the shape of the inner peripheral surface of each shape steel being edged. By changing the guide member means, different shape steels, such as H-shape, I-shape, and channel steels, of various dimensions can be easily edged.

3,566,657

CONTINUOUS ROLLING MILL TRAIN FOR ROLLING BAR STOCK

Franz Blinn, St. Ingbert (Saar), Germany, assignor to Verwaltungsgesellschaft Moeller und Neumann Offense Handelsgesellschaft, St. Ingbert (Saar), Germany

Filed Nov. 22, 1968, Ser. No. 778,068
Claims priority, application Germany, Nov. 30, 1967, P 16 02 220.1
Int. Cl. B21b *13/08*
U.S. Cl. 72—234 5 Claims



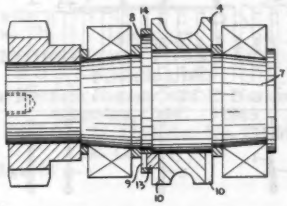
In a continuous rolling mill train for bar stock each three successive rolling mill stands are provided with a common drive. The central stand of each set of three stands is a vertical stand so that inside the three stand set the rolled product is not twisted.

3,566,658

COLD ROLLING MILL WITH ROLL PASS RING

Fritz Zeunert, Rheydt, Germany, assignor to Mannesmann-Meer Aktiengesellschaft, Monchen-Gladbach, Germany

Continuation of application Ser. No. 582,288, Sept. 27, 1966. This application Oct. 20, 1969, Ser. No. 867,960
Claims priority, application Germany, Oct. 26, 1965, M 67,061
Int. Cl. B21b *31/08*
U.S. Cl. 72—238 1 Claim



A cold rolling mill of the step-back type has a rotatable shaft and a roll pass ring heat shrunk thereon sufficiently intensively for the slip-free carrying out of high-speed step-back rolling.

3,566,659

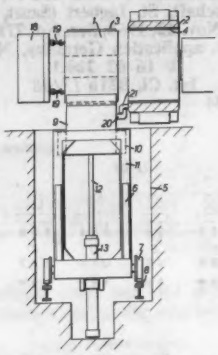
HORIZONTAL EXTRUSION PRESSES

Ian Lewis Cameron, Blandford Forum, England, assignor to Fielding Plant Design Limited, Bournemouth, England

Filed Nov. 29, 1968, Ser. No. 779,897
Claims priority, application Great Britain, Dec. 1, 1967, 54,861/67
Int. Cl. B21c *23/00*
U.S. Cl. 72—263 8 Claims

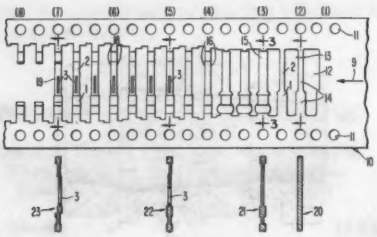
A horizontal extrusion press including a transfer arrangement for the rapid and convenient removal of a press container and its replacement by another without recourse to the use of an overhead crane, the said transfer arrangement being brought into accurate location at the centreline of the press and the container being axially slidably

removed from its holder on to the transfer arrangement where it is supported. After removal from the holder, the



container is next moved downwards below the press columns and then away from the press to an outside station.

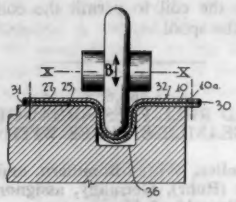
3,566,660
MANUFACTURING METHOD TO PRODUCE PRINTING TYPE
Frank Dedek, Westland, Mich., assignor to Burroughs Corporation, Detroit, Mich.
Continuation of application Ser. No. 683,524, Nov. 16, 1967. This application Feb. 28, 1968, Ser. No. 708,892
Int. Cl. B21d *28/00, 31/00, 31/06*
U.S. Cl. 72—339 **15 Claims**



A method of forming printing type from a sheet metal strip which is passed through a progressive die, the method including the steps of indexing the metal strip through the die, producing printing type blanks with integrally connected head and hardened shank portions by punching and swaging operations and later severing each completed type blank from the strip. The head portion of the several type blank then is subjected to a character forming operation while the shank portion is firmly clamped in a holding fixture.

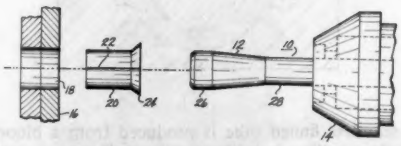
3,566,661
METAL FORMING
Gerald P. McCafferty, Churchville, Pa., Frederick Rudolph, Jr., Cherry Hill, N.J., and Harry P. Schane, Lafayette Hill, Pa., assignors to The Budd Company, Philadelphia, Pa.
Filed July 29, 1968, Ser. No. 748,444
Int. Cl. B21b *1/00;* **B21c** *37/02;* **B23p** *17/00*
U.S. Cl. 72—365 **3 Claims**

A method of metal forming, as by rolling, a thin sheet metal part such as titanium in pack fashion whereby the part to be formed is sandwiched between inner and outer cover sheets of sufficient strength to provide support for



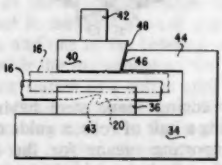
the thin part. The cover sheets are mechanically restrained from slippage by edge welding.

3,566,662
COLDWORKING METHOD AND APPARATUS
Louis A. Champoux, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.
Filed Apr. 28, 1969, Ser. No. 819,896
Int. Cl. B21d *39/06*
U.S. Cl. 72—370 **13 Claims**



A method and apparatus using disposable sleeves for coldworking of holes. The apparatus uses a tapered oversized plug element with a thereon positioned thin-walled split sleeve. The plug element is inserted with the sleeve into a hole. When the plug element is pulled back through the hole, the sleeve is kept in the hole by the apparatus so that radially outwards directed forces are exerted by the plug on the sleeve, which in turn transmits the coldworking forces to the wall of the hole. After the plug is pulled out of the hole, the sleeve is removed from the hole and discarded.

3,566,663
FELTING NEEDLE
Josef Zocher, Haaren, Achen, Germany, assignor to The Singer Company, New York, N.Y.
Original application June 1, 1967, Ser. No. 642,753, now Patent No. 3,464,097, dated Sept. 2, 1969. Divided and this application Jan. 9, 1969, Ser. No. 803,515
Int. Cl. B21q *1/06*
U.S. Cl. 72—376 **3 Claims**



This disclosure relates to the needle art and in particular to felting needles and methods of making the same. Felting needles are of the general type which have barbs or other irregularities on their surfaces for engaging the loose fibers presented in a batt of loose fibers and for compacting the fibers into a relatively dense matt of fiber

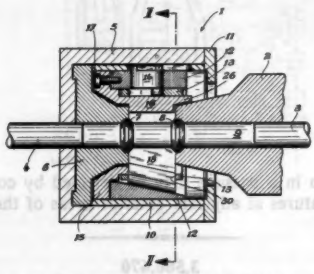
material. The present disclosure deals with improvements in needles of this type and in methods of making the same with the result being an overall improvement in the felting process.

3,566,664

APPARATUS FOR COLD AND WARM PRESSING OF UNDERCUT PREPRESSED BODIES

Herbert Schweizer, Kandern, Germany, assignor to F. B. Hatebur Aktiengesellschaft, Basel, Switzerland

Filed June 18, 1968, Ser. No. 737,873
Claims priority, application Germany, June 20, 1967, H 63,056
Int. Cl. B21d *41/00*
U.S. Cl. 72—402 6 Claims



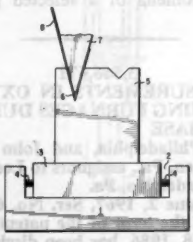
Device for press forming workpieces to form protuberances thereon in which an anvil body has a matrix member fixed in one end and a moveable matrix member axially moveable into the body at the other end. Radially moveable jaws in the body are actuated radially inwardly by axial movement of the moveable matrix member into the body so as to embrace a rod-like workpiece which has one end disposed in a hole in each matrix member. Further axial movement of the moveable matrix takes place together with the jaws so the workpiece is caused to change shape only in the unsupported region thereof between the fixed matrix member and the jaws.

3,566,665

SHEET METAL FORMING PRESS FOR FORMING FLATTENED HORNS ON THE EDGES OF SHEET METAL BLANKS

Joseph Birrer, Zofingen, Switzerland, assignor to Hammerle A.G., Zofingen, Switzerland

Filed Apr. 15, 1968, Ser. No. 721,467
Claims priority, application Austria, Apr. 21, 1967, A 3,776/67
Int. Cl. B21j *13/02*
U.S. Cl. 72—404 2 Claims



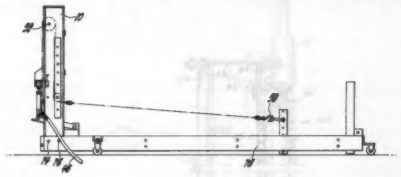
The disclosure provides a sheet metal forming press for forming flattened horns on the edges of sheet metal blanks which comprises a bolster mounted between centering springs permitting the bolster to yield in a direction normal to the direction of pressing; a vertically movable die adapted to be lifted off and lowered onto said bolster, and a vertically movable forming punch cooperating with said die, the arrangement being such that the sheet metal blank is optionally interposable between the forming punch and the die or between the underside of the die and the bolster.

3,566,666

CONTINUOUS TENSION TOWER

Harry J. Berendt, 9251 Rockland, Detroit, Mich. 48239, and Robert R. Ramsay, 18101 Magnolia Parkway, Southfield, Mich. 48075

Filed Aug. 20, 1968, Ser. No. 753,950
Int. Cl. B21d *11/00*; B21j *7/46, 13/00*
U.S. Cl. 72—444 3 Claims



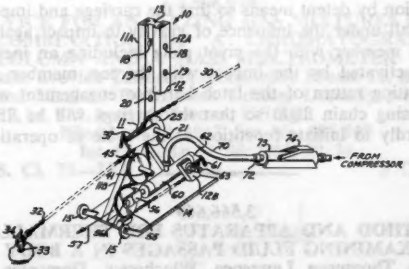
A continuous tension tower is shown wherein a tension applying member, such as a chain, is routed, over two or more sheaves mounted on a tower, between a workpiece and a lever. A tension force is applied to the chain by a limited stroke force applying expansible fluid motor which acts on the lever. The lever is adapted to provide a variable lever arm ratio between the motor and the chain. A tension retaining member is also located on the tower to maintain the tension on the chain when the force on the motor is released.

3,566,667

MULTIDIRECTION POWER ACTUATED FORCE UNIT

William Kenneth Hagerty, 605 E. Norwood Place, Alhambra, Calif. 91803

Filed Oct. 28, 1968, Ser. No. 771,094
Int. Cl. B21j *7/46*
U.S. Cl. 72—444 26 Claims



The disclosed invention provides combination pulls through a power actuated ram mounted on a force unit. The unit includes a pair of parallel upstanding posts which are each mounted on inverted-V legs. The pair of inverted-V legs are, in turn, mounted on a base. A power actuated ram is positioned between the leg pair with a mounting end secured between two legs of the inverted-V's by a pin passing through an opening in the legs and

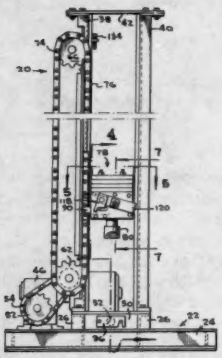
in the mounting end of the ram. The other end of the ram is free to travel parallel to the base. The traveling end of the ram is adapted to receive a chain which is threaded through a pulley combination. One end of the chain is secured to the unit at a point on or near the mounting end of the ram. The other end of the chain is passed over a fulcrum pulley on the upstanding post and is secured to a workpiece. The pulls may be readily varied in travel amount and force by different pulley sizes and/or ram mounting arrangements.

3,566,668

IMPACT TEST MACHINE

James E. Browning and David Hull Youngblood, San Antonio, Tex., assignors to Southern Steel Company, San Antonio, Tex.

Filed July 30, 1969, Ser. No. 846,004
Int. Cl. G01n *3/34*
U.S. Cl. 73—12 **5 Claims**



An impact test machine for impacting a test member a plurality of times with an impact tool mounted on a carriage for vertical movement along a pair of guide channel members with a vertically rising chain flight adjacent the guide channel members and a latch bar engageable with the rising chain flight to lift the carriage to an upper position and a pivot plate engaging the latch bar and pivoted by a stop on the top of one of the guide channels for moving the latch to a retracted position for retention by detent means so that the carriage and impact tool fall under the influence of gravity to impact against a test member with the pivot plate including an inertia arm activated by the impact with the test member for permitting return of the latch bar into engagement with the rising chain flight so that the carriage will be lifted upwardly to initiate repetition of the cycle of operation.

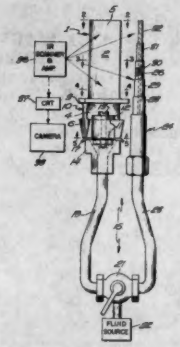
3,566,669

METHOD AND APPARATUS FOR THERMALLY EXAMINING FLUID PASSAGES IN A BODY

Willis Thompson Lawrence, Winchester, Domenico S. Sarcia, Saugus, and David B. Spaulding, Carlisle, Mass., assignors to Harry Parker, West Hartford, Conn.

Filed Sept. 4, 1968, Ser. No. 757,435
Int. Cl. G01n *25/00*
U.S. Cl. 73—15 **12 Claims**

The thickness of walls around cooling passages through a turbine blade is detected by passing a heated or cooled fluid through the passages and sensing the resulting temperature pattern on the exterior of the walls. The temperature pattern may be compared with the pattern on a standard body having known graduated wall thicknesses and simultaneously supplied with the same fluid. Or an



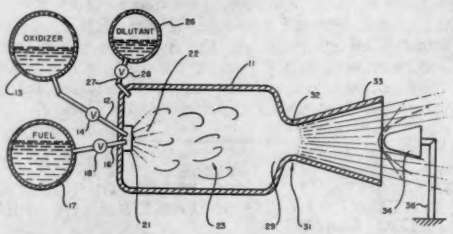
obstruction in a passage may be detected by comparison of temperatures at adjacent exterior areas of the body.

3,566,670

REENTRY VEHICLE HEAT SHIELD TESTING APPARATUS AND METHOD

Roald Arne Rindal, Sunnyvale, Calif., assignor to Aerotherm Corporation, Palo Alto, Calif.

Filed June 26, 1967, Ser. No. 648,792
Int. Cl. G01n *3/60*
U.S. Cl. 73—15.4 **3 Claims**



An apparatus and method for testing reentry vehicle heat shields which utilizes a high pressure hot gas generator which operates on the chemical-to-thermal energy conversion principle with an oxidizer-fuel combination which yields combustion products simulating heat shield degradation phenomena of a selected planetary atmosphere.

3,566,671

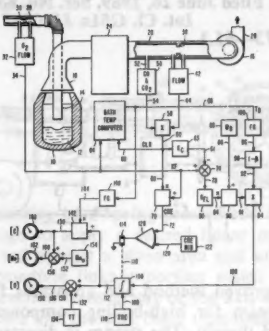
PROCESS MEASUREMENTS IN OXYGEN BLOWN STEEL REFINING FURNACES DURING THE FINISH BLOW PHASE

Bernard Blum, Philadelphia, and John W. Schwartzenberg, Maple Glen, Pa., assignors to Leeds and Northrup Company, Philadelphia, Pa.

Filed June 2, 1967, Ser. No. 643,226
The portion of the term of the patent subsequent to Oct. 28, 1986, has been disclaimed
Int. Cl. G01n *33/20*
U.S. Cl. 73—23 **14 Claims**

During the finish blow phase of a B.O.F. heat the dissolved oxygen, the carbon concentration and the manganese concentration of the bath are determined by carry-

ing out a continuous oxygen balance from a starting point when the carbon concentration is sufficiently high to be determined with adequate accuracy by other means (for example, .20%). The oxygen balance is carried out by subtracting from a signal representative of the total oxygen flow to the furnace, a signal representing the oxygen lost in carbonatious gases and modifying the resulting signal which is representative of the total FeO in the slag and in the bath in accordance with a factor indicative of



the relative distribution of FeO in the bath and the slag to thereby obtain a measurement of the FeO and hence the dissolved oxygen in the bath alone.

The carbon concentration in the bath is determined from the known relationship between the dissolved oxygen in the bath and the carbon concentration at low carbon values. The manganese concentration is also determined in accordance with the fixed relationship it has with the dissolved oxygen and the carbon concentration in the bath.

3,566,672

HEATED CHEMICAL CONVERSION FILTER ASSEMBLY FOR AEROSOL ANALYSIS

Hugh R. Carlon, Edgewood, Md., assignor to the United States of America as represented by the Secretary of the Army

Filed June 15, 1967, Ser. No. 646,801
Int. Cl. G01n *31/10*
U.S. Cl. 73—23 **2 Claims**

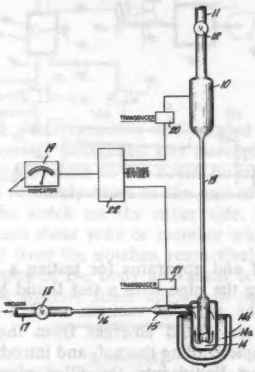
Improved heater means-prefilter assembly and method for utilization in nerve gas detection devices, whereby air containing aerosol is sampled, the air sample is passed over a prefilter element to wet the prefilter element surfaces with aerosol, and the surface of the prefilter element is heated by an isolated heater means from the nonactive side to convert the aerosol particles on the prefilter active surface to vapor analog to pass to a vapor detecting means.

3,566,673

METHOD AND APPARATUS FOR MEASUREMENT OF CONCENTRATION OF A GAS IN A GAS MIXTURE

Abraham Kogan, 35a Trumpelder Ave., Neve Shaanan, Haifa, Israel

Filed Feb. 28, 1968, Ser. No. 709,119
Int. Cl. G01n *31/06*
U.S. Cl. 73—23 **13 Claims**



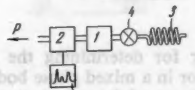
A method and apparatus for determining the concentration of a gas component in a gas mixture which includes discharging the gas mixture from a first chamber through a restricted passage under choked flow conditions, separating the gas which is to be measured as to its concentration in the mixture, introducing the separated gas into a second chamber and discharging it from the second chamber through a restricted passage under choked flow conditions, and measuring the ratio of the pressure of the second chamber to the pressure of the first chamber.

3,566,674

DEVICE FOR ANALYZING GAS MIXTURES BY A COMBINATION OF A CHROMATOGRAPHIC COLUMN AND A MASS SPECTROMETER

Viktor Lvovich Talroze, Vorobievskoe Shosse 11, kv. 21, and Vladimir Dmitrievich Grishin, Leninsky prospekt 57, kv. 161, both of Moscow, U.S.S.R.

Filed Nov. 29, 1967, Ser. No. 686,547
Int. Cl. G01n *31/08;* H01j *39/34*
U.S. Cl. 73—23.1 **3 Claims**



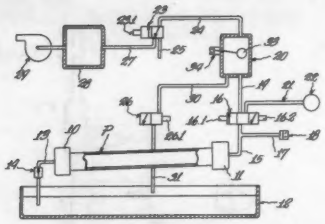
A device for analysis of gas mixtures comprises a chromatographic column connected to an effusion cell for determining the molecular weight of the mixture components, the effusion cell in turn being connected to a

mass spectrometer with recording instruments, a valve being provided between the column and the cell for periodically closing communication therebetween during analysis. The output of the mass spectrometer during the periods of valve closure is integrated to provide data for the molecular weight determination.

3,566,675
METHOD OF AND APPARATUS FOR PRESSURE TESTING HOLLOW BODIES

Harry C. Ledebur, Canfield, Ohio, assignor to Wean Industries, Inc., Youngstown, Ohio

Filed Feb. 6, 1969, Ser. No. 796,996
Int. Cl. G01m *3/64*; G01n *3/12*
U.S. Cl. 73—49.5 7 Claims

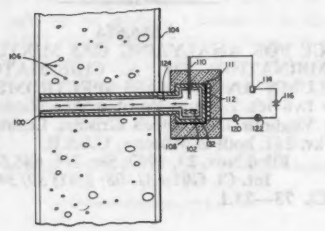


Method of and apparatus for testing a length of pipe by first filling the pipe with a test liquid by drawing the latter into the pipe by vacuum until a predetermined quantity of test liquid emerges from the pipe thereby assuring complete filling thereof, and introducing sufficient additional test liquid into the filled pipe from a high pressure source until the desired test pressure has been developed within the pipe.

3,566,676
FLUID PHASE ANALYZER

Lance G. Hays, Pasadena, Calif., assignor to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Apr. 17, 1969, Ser. No. 816,988
Int. Cl. G01n *25/00*
U.S. Cl. 73—61 15 Claims

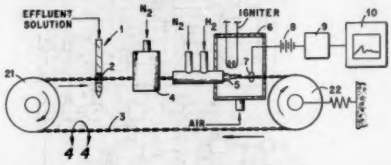


An analyzer for determining the relative amount of liquid and vapor in a mixed phase body of fluid. A hollow closed-end gage containing a heat transport fluid and having its walls lined with a capillary wick is partially inserted into contact with both phases of the body. Heat is exchanged with the body and heat is transferred from the portion immersed in the body to an external portion of the gage. In one embodiment a thermocouple attached to the external portion measures a parameter related to the heat transferred and therefore the phase distribution. In another embodiment, the thermocouple is utilized to maintain the wall temperature at a fixed temperature and energy input to a heater associated with the external portion provides the desired parameter.

3,566,677
METHOD AND APPARATUS FOR MONITORING CONTENT OF FLOWING STREAMS

Benjamin T. Cole, Columbus, S.C., and Richard H. Stevens, Oak Ridge, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed June 26, 1969, Ser. No. 836,729
Int. Cl. G01n *31/08*
U.S. Cl. 73—61.3 10 Claims

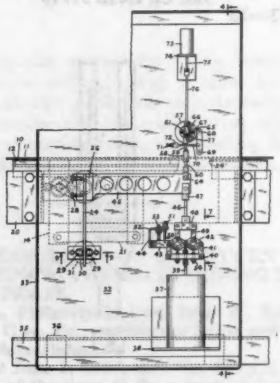


An improved method and apparatus for monitoring a liquid stream for high-boiling components dissolved or suspended therein. The stream is directed across a space defined by parallel horizontal extending surfaces to bridge the surfaces as a dynamic, flat-faced drop held therebetween by surface tension. Outflow from the drop is directed as a film down a drainage member to drip from its tip. A conveyor comprising spaced-apart groups of interconnected loops is passed through the drop to capture samples thereof in the conveyor loops, after which the loaded conveyor is passed through a heated zone to remove the liquid and any low-boiling components therein. The conveyor then is passed through a second heated zone to gasify any residue on the conveyor. The gasified residue is monitored with a gas chromatography mass detector.

3,566,678
MASS MEASURING SYSTEM

John L. Christmann, Passaic, N.J., assignor to Merrick Scale Mfg. Company, Passaic, N.J.

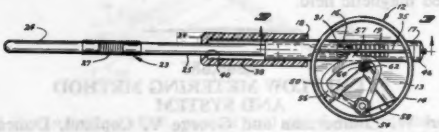
Filed Apr. 24, 1968, Ser. No. 723,834
Int. Cl. G01n *29/00*
U.S. Cl. 73—67.2 8 Claims



The present invention comprises an elastic member deflected and oscillated by a load, electromagnetic means to excite and sustain the oscillation of the elastic member, a transformer actuated by the oscillation of the

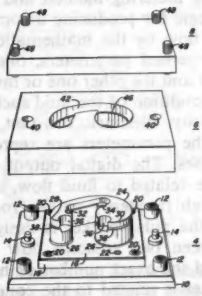
elastic member and electrically connected to the electromagnetic means, and means electrically connected to the electromagnetic means and the transformer to count the oscillations and including a differential pulse system.

3,566,679
LINEAR PRESSURE DEVICE
Irwing N. Toftness, 1425 2nd Ave., Cumberland, Wis. 54829
Filed Aug. 21, 1969, Ser. No. 851,953
Int. Cl. G01l 5/00; G01n 3/40; A61b 9/00
U.S. Cl. 73—78 2 Claims



A device consisting of a spring pressed rod in connection with a gauge to apply a desired linear pressure by means of said rod against a given area and said rod includes an intermediate linkage portion which will yield and flex in a direction transversely of the axis of said rod to visually indicate that pressure other than linear pressure along the axis of said rod is being applied.

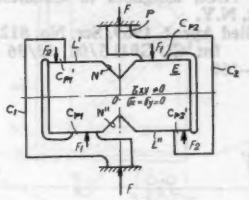
3,566,680
METHOD AND APPARATUS FOR DETERMINING THE FLANGEABILITY OF SHEET METAL
Joseph D. Dankoff, Derry Township, Westmoreland County, and Andrew Lesney, Frazer Township, Allegheny County, Pa., assignors to United States Steel Corporation
Filed Nov. 29, 1968, Ser. No. 780,090
Int. Cl. G01n 3/28
U.S. Cl. 73—100 9 Claims



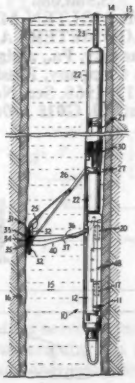
A sheet metal flangeability tester overflanges a sample around cylindrical dies having progressively changing radius. The maximum radius at which a fracture occurs in the flange is a measure of flangeability.

3,566,681
METHOD AND APPARATUS FOR PURE SHEAR TESTING OF ROCKS AND OTHER BUILDING MATERIALS
Nicolaie Iosipescu and Radu Matak, Bucharest, Rumania, assignors to Incerc Institutul de Cercetari in Constructii si Economia Constructilor, Bucharest, Rumania
Filed Dec. 20, 1968, Ser. No. 785,692
Int. Cl. G01n 3/24
U.S. Cl. 73—101 11 Claims

A shear-testing system for specimens of rock, mineral and man-made construction materials, e.g. concrete, in which the fracture is caused solely by pure shear. The specimen is a rectangular parallelopiped which is formed with a pair of right-angled notches at opposite parallel longitudinal sides of the body to a depth of one quarter of the height between these faces and is provided along its lateral faces with a pair of channels bridging the notches and of a depth of one-third the thickness of the body, thereby forming a central shear section in a median plane of the body through the vertices of the right-angled notches. The specimen is clamped between a pair of relatively movable shear members of C-shaped configuration which are inversely positioned and have pressure pieces disposed relatively close to the notch on one side of the specimen and relatively close to the end of the body remote from the notch on the other side. The pressure members of each shear yoke or member which are proximal and distal from the notches, respectively, are located on opposite sides of the body and shear is generated by compressive or tractive stress applied to these members.



3,566,682
RADIOACTIVITY AND ELECTRICAL LOGGING TOOL COMBINATION
John H. Winkler, Jr., Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.
Filed Jan. 22, 1969, Ser. No. 792,974
Int. Cl. E21b 49/00
U.S. Cl. 73—152 5 Claims



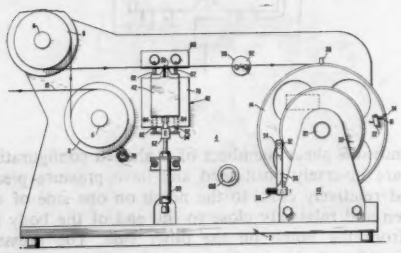
An illustrative embodiment of the invention is directed to a combination sidewall redioactivity and electrical logging tool. One or more radiation detectors spaced from a source of radioactivity are housed within a skid that is urged against the borehole wall. A backup pad extending from the opposite side of the logging tool also is urged against the borehole wall. The working surface of the pad is formed of a tough electrical insulator that supports three vertically spaced electrodes. The electrodes

are either flush with or recessed in the face of the insulator. This structural arrangement prevents the exposed electrodes from being short-circuited through the drilling mud or from being torn off the pad during operation.

3,566,683
NEEDLE PULL TESTER

Jackie Neal Bulla, Peter Conrad, Billy Brown Fesperman, Robert Edwin Hinson, Jr., and Charles E. Holland, Charlotte, N.C., assignors to Celanese Corporation, New York, N.Y.

Filed Apr. 1, 1969, Ser. No. 812,219
Int. Cl. G01l *5/06, 33/36*
U.S. Cl. 73—160 **5 Claims**

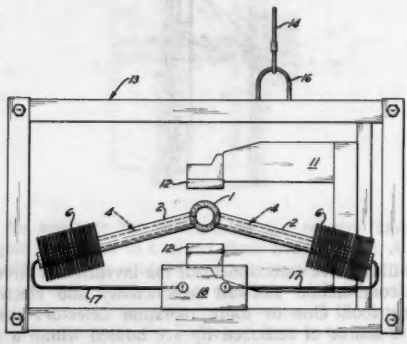


The degree of entanglement in a length of yarn is measured by arranging the yarn along a predetermined path with a needle positioned adjacent the yarn path. The yarn is spread laterally adjacent the needle at a predetermined tension and the yarn is then pierced by the needle. The yarn is moved relative to the needle along the yarn path and when an increase in tension in the yarn above a predetermined value is reached, the length of the relative movement of the yarn is a measure of the degree of entanglement of the yarn.

3,566,684
ELECTRODES FOR MOLTEN METAL ELECTROMAGNETIC FLOWMETERS AND THE LIKE

Earle C. King, Evans City, Pa., assignor to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed July 17, 1968, Ser. No. 745,545
Int. Cl. G01f *1/00*
U.S. Cl. 73—194 **10 Claims**

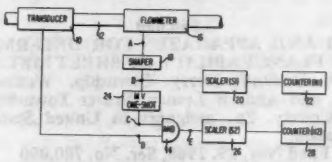


This invention relates to means for making electrical contact with a stream of molten metal flowing in an electrically non-conductive flow tube. Such means include a branch tube of electrically non-conductive material communicating with the interior of the flow tube and a metal electrode disposed in the branch tube. This electrode is characterized by being in part liquid and in part solid, the portion thereof adjacent the flow tube and in electrical contact with the stream of molten metal therein being in the molten state and the portion thereof remote from the flow tube being in the solid state, the branch tube being sealed by the solidified molten metal of the electrode. The invention is particularly useful in connection with molten metal electromagnetic flowmeters by providing electrodes that will conduct the electrical signal generated by molten metal flowing through an electrically non-conductive flow tube subjected to an externally applied magnetic field.

3,566,685
FLUID FLOW METERING METHOD AND SYSTEM

Carl W. Zimmerman and George V. Copland, Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Continuation-in-part of application Ser. No. 704,403, Feb. 9, 1968. This application July 5, 1968, Ser. No. 750,675
Int. Cl. G01f *1/00*
U.S. Cl. 73—194 **29 Claims**



A fluid flow metering method and system using digital signals and logic for producing a compensated manifestation of fluid flow by the mathematical multiplication of two or more sensed parameters, one parameter being a fluid flow rate and the other one or more parameters being related to a condition of the fluid such as its constituency, pressure, density, dielectric constant, temperature or the like, where the parameters are represented by series of electrical pulses. The digital output signal pulses of the flowmeter are related to fluid flow, and are used to gate packets of high frequency pulses from a transducer. The duration of the pulse packet is designed to be less than spacing between two adjacent flow pulses at maximum flow rate, and the exact number of high frequency pulses in each packet is related to the condition of the fluid as sensed by the transducer.

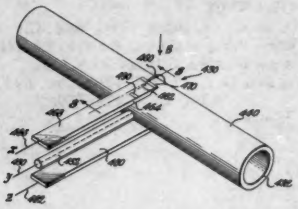
3,566,686
ELECTROMAGNETIC FLOWMETER INCLUDING HUM COMPENSATION MEANS

Vincent J. Cushing, 9804 Hillridge Drive, Kensington, Md. 20795

Division of application Ser. No. 717,063, Mar. 6, 1968, now Patent No. 3,479,871, which is a continuation-in-part of application Ser. No. 558,484, June 17, 1966, which in turn is a continuation-in-part of application Ser. No. 449,930, Apr. 14, 1965, now Patent No. 3,274,831. This application Dec. 12, 1968, Ser. No. 812,498
Int. Cl. G01p *5/08*
U.S. Cl. 73—194 **5 Claims**

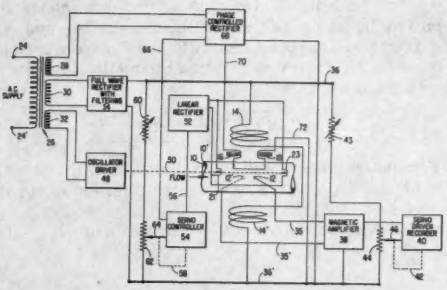
Two detecting electrodes are disposed at opposite sides of a flow conduit, and a guard means including a third electrode is disposed adjacent to a high impedance elec-

trode which is connected with a high impedance portion of the associated electrical network. An alternating magnetic field is produced within the flow conduit. In a first form of the invention, a first hum compensation voltage is impressed upon at least one of the electrodes and a second independent hum compensation voltage is impressed on another of said electrodes. In a second form



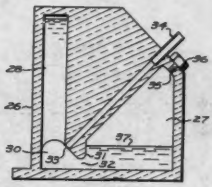
of the invention, first, second and third lead means are connected with the high impedance detecting electrodes, the low impedance detecting electrode and the guard means respectively, and means is provided for adjusting the lead means to control the amount of net flux threading the circuit loops including said lead means so as to provide substantially no net flux.

3,566,687
ELECTROMAGNETIC FLOWMETER FOR METALLIC FLUIDS
Eugene Mittelmann, Chicago, Ill., assignor to Bailey Meter Company
Filed Oct. 29, 1969, Ser. No. 872,001
Int. Cl. G01p *5/08*
U.S. Cl. 73—194 **13 Claims**



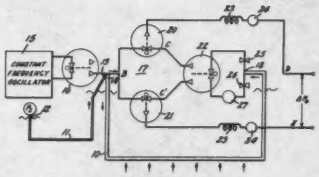
An apparatus for measuring the volumetric flow rate of metallic fluids in a conduit with a feedback compensating system which maintains the magnetic flux distribution in the conduit relatively constant. A device for the detection of D.C. magnetic fields and a pair of electromagnet coils, producing the magnetic flux field, are so positioned that the magnetic field detecting device generates a signal representative of any change in magnetic flux density in the conduit, near the termination of the magnetic field along the flow axis. This signal is then coupled to a servo-controller, and the servo-controller outputs an error control signal proportional to the magnetic field shift along the flow axis caused by magneto-hydrodynamic effects of the moving liquid metal. A pair of compensating coils, energized by the servo-controller and magnetically coupled to the field producing coils, are polarized so as to sustain the magnetic flux density near the termination of the magnetic field at substantially the same relative value, as for zero fluid motion, in order to provide a linear indication of flow independent of the electrical currents circulating in the moving metallic fluid.

3,566,688
GAS VOLUME INDICATOR
Richard K. Hansen, Sacramento, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.
Filed Mar. 26, 1969, Ser. No. 810,637
Int. Cl. G01n *1/22*
U.S. Cl. 73—223 **10 Claims**



A gauge according to the present disclosure comprises a housing having a wall defining a displacement chamber and a resorvoir chamber in communication with each other at one end of the displacement chamber so that the displacement chamber can be filled with liquid by resting the gauge on its side. Inlet means for admitting gas is disposed below the displacement chamber. A displacement liquid is disposed within said housing so that gas admitted through the inlet displaces liquid from the displacement chamber, and the volume of gas can be measured. According to an optional feature of this disclosure, the inlet is at approximately the same elevation as the liquid level in the reservoir when the displacement chamber is filled so that virtually no pressure head is created above the inlet due to the liquid in the reservoir.

3,566,689
FLUIDIC TEMPERATURE SENSOR SYSTEM
Carl G. Ringwall, Scotia, and Lonny R. Kelley, Ballston Lake, N.Y., assignors to General Electric Company
Filed Oct. 17, 1968, Ser. No. 768,423
Int. Cl. G01k *1/16, 11/24*
U.S. Cl. 73—339 **17 Claims**

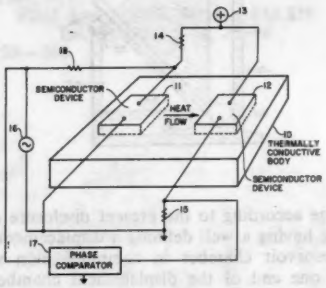


A fluidic temperature sensing system adapted for measuring an average temperature in a relatively large region utilizes the phase shift characteristic of a long fluid transmission line. A temperature sensing tube and preheater tube are arranged in a region whose temperature is to be measured and a variably pressurized fluid is circulated through the sensor tube. The fluid at the input end of the sensor tube is excited by a constant frequency fluidic oscillator to provide the pressure variation, and a fluidic phase discriminator is connected across the tube for detecting a phase shift of the pressure wave in its transmission through the sensor tube. The phase shift across the sensor tube of fixed length is proportional to the absolute temperature of the fluid within the tube, and if the tube is exposed to varying temperature the phase shift represents an average temperature.

3,566,690
THERMAL DELAY SEMICONDUCTOR THERMOMETER

Jalal Ebrahimi, Ottawa, Ontario, Canada, assignor to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed Aug. 20, 1969, Ser. No. 851,688
Int. Cl. G01k 7/00; G01n 25/20
U.S. Cl. 73—339 4 Claims

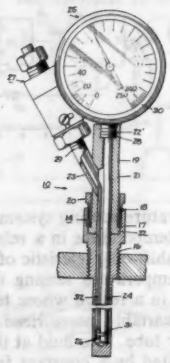


A temperature measuring apparatus comprising two semiconductor devices (which may be resistors, diodes or transistors) embedded in a thermally conductive body and separated by a small distance. An A-C input signal is converted by one device into heat energy which flows through the body to the other device, generating an A-C output signal. The phase difference between the two signals is measured and, since the phase difference is temperature dependent, the temperature of the body may thus be determined.

3,566,691
DUAL ELEMENT WELL ASSEMBLY

Walter J. Halpern, Forest Hills, and William Stoll, East Meadow, N.Y., assignors to Moeller Instrument Company Inc., Richmond Hill, N.Y.

Filed Apr. 10, 1969, Ser. No. 815,534
Int. Cl. G01k 5/32, 7/00
U.S. Cl. 73—343 15 Claims

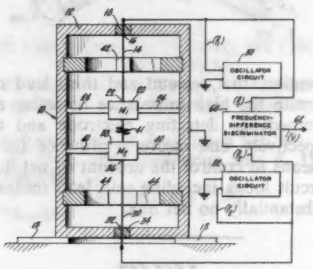


The thermometer and remote temperature detector are both mounted within a well assembly such as within a boiler or gear box structure with the detector secured by the retaining band to the base of the thermometer stem. The detector leads out to a remote indicator so that the temperature detected by the thermometer can be read at a remote point from the thermometer.

3,566,692
APPARATUS FOR MEASURING ACCELERATIONS, ESPECIALLY THE ACCELERATION OF GRAVITY

Robert O. Bock, Garden City, and Charles D. Bock, Plainview, N.Y., assignors to AMBAC Industries, Incorporated, Garden City, N.Y.

Filed Dec. 27, 1967, Ser. No. 693,837
Int. Cl. G01v 7/00
U.S. Cl. 73—382 5 Claims



A vibrating-string type of gravimeter comprising a pair of proof-mass elements connected together by a spring, and a pair of vibrating strings each stretched between a different one of the proof-mass elements and the supporting frame. Preferably the two strings are identical, but the linearity of response of the gravimeter is improved by using values for the masses M_1 and M_2 of the two proof-mass elements which differ from each other, typically by several percent, substantially in accordance with the relationship:

$$M_1=\left[\frac{T_0+M_1g_0+K}{T_0-M_2g_0+K}\right]^{3/4}M_2$$

T_0=the tension in both of said strings in the absence of net acceleration acting along the direction of the length of said strings,

g_0=a fixed reference value of the acceleration of gravity,

and

$$K=\frac{EI}{l^2}, \text{ where}$$

E=elastic constant of said strings,
I=section modules, and
l=length of each string.

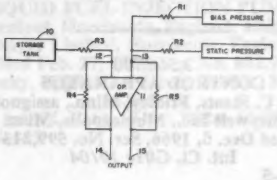
3,566,693
FLUIDIC ALTITUDE SENSOR

Vernon H. Ayre, Falkville, Ala., assignor to the United States of America as represented by the Secretary of the Army

Filed Oct. 3, 1969, Ser. No. 863,637
Int. Cl. G01l 7/00
U.S. Cl. 73—384 4 Claims

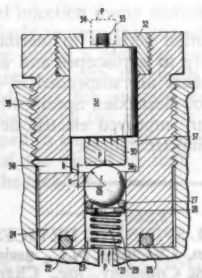
A fluidic system which has an output related to height above or below a given null altitude is shown. In one embodiment, a fluidic operational amplifier has an input related to the desired null altitude, and further inputs related to static pressure and fixed bias pressure. The inputs are applied through resistors, and feedback is taken through further resistors. Another embodiment is similar to the one described above, but with additional resistors,

one inserted between the bias input and its resistor and another between the one resistor and the null input. These



resistors compensate for the nonlinear pressure gradient of the earth's atmosphere.

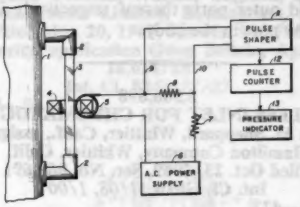
3,566,694
PRESSURE TRANSDUCER
Josef Vogel, Winterthur, and Hans C. Sonderegger, Neftenbach, Switzerland, assignors to Kistler Instruments AG, Winterthur, Switzerland
Filed Nov. 8, 1968, Ser. No. 774,359
Claims priority, application Switzerland, Nov. 8, 1967, 15,640/67
Int. Cl. G011 *9/00, 27/00*
U.S. Cl. 73—398 **4 Claims**



A pressure transducer for converting a pressure into a mechanical force consists of a bore in which an element with a ball-like surface is fitted with a very small clearance, with means to center this converter element with a sealing device and a force measuring platform with a hard and polished surface perpendicular to the axis of the bore. The pressure sending element is arranged in such a way that the ball-like element rests free and adjustable on the flat surface having practically no deflection when measuring a full range of pressures, which can exceed 100,000 p.s.i.

3,566,695
LIQUID METAL PRESSURE GAGE
Charles A. Guderjahn, Northridge, Calif., assignor to the United States of America as represented by the United States Atomic Energy Commission
Filed June 9, 1969, Ser. No. 831,476
Int. Cl. G011 *9/00*
U.S. Cl. 73—398 **7 Claims**

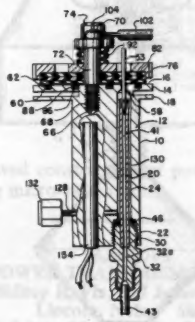
A liquid metal gage is provided with a venturi type sampling tube, wherein an adjustable electrical current is passed through the portion of the sampling tube. At a predetermined current flow, the temperature of the sampled liquid metal increases until vaporization occurs to interrupt the current flow. The time period during which current flowed is a function of system pressure. A sampling and counting, up to the time of vaporization, of the current pulses over a period of time indicates the pressure within the system.



3,566,696
VALVE STEM
William D. Maddison, 112 E. Shore Road, Denville, N.J. 07834, and James J. De Lade, Butler, N.J. (195C Main St., Little Falls, N.J. 07424)
Filed Dec. 24, 1968, Ser. No. 786,560
Int. Cl. G011 *7/00*
U.S. Cl. 73—420 **7 Claims**

A valve stem operative of a valvular assembly which carries a fluid gauge on the "handle end" thereof. The stem is bored through to admit fluid therethrough for registration of the condition thereof on said gauge, and said gauge constitutes the manipulating handwheel as well.

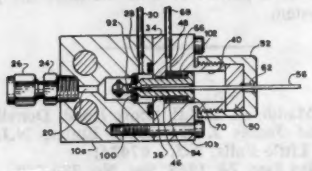
3,566,697
AUTOMATIC SEPTUM CHANGING INLET
Tom H. Vannus, Pomona, Calif., assignor to Hamilton Company, Whittier, Calif.
Filed July 28, 1969, Ser. No. 845,433
Int. Cl. G01n *1/00, 31/08*
U.S. Cl. 73—422 **17 Claims**



A septum changing inlet apparatus for chromatographs having a ported body and a septum disc carried by a rotatably mounted ratchet wheel having a plurality of an-

nularly spaced outer ports which may be successively moved into alignment with the port of the body, there being means for successively rotating the ratchet wheel to move said outer ports thereof respectively into alignment with the port in the body.

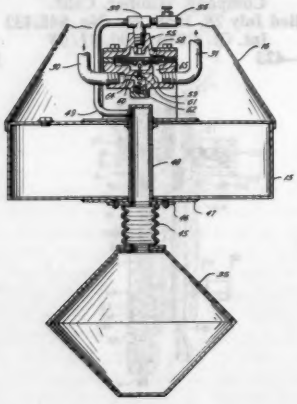
3,566,698
SEPTUMLESS INLET FOR CHROMATOGRAPHS
William M. Sheppard, Whittier, Calif., assignor to Hamilton Company, Whittier, Calif.
Filed Oct. 23, 1969, Ser. No. 868,691
Int. Cl. G01n *31/08, 1/00*
U.S. Cl. 73—422 **8 Claims**



An inlet apparatus for chromatographs, having a shuttle movable between a normal inoperative, retracted position and a second, operative position.

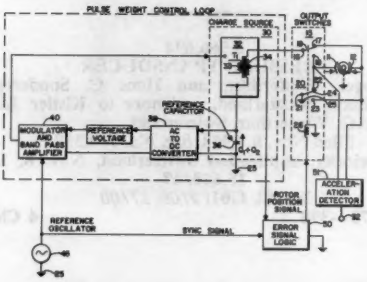
When the needle of a syringe or syringe apparatus is inserted into the inlet apparatus, the syringe apparatus seals with the bore of the shuttle and as the syringe is pushed further into the apparatus, the shuttle is moved to the second position so that when a side port in the syringe is opened, carrier gas enters the side opening and washed the sample from the syringe, through the shuttle bore and into the column of the chromatograph.

3,566,699
APPARATUS FOR MEASURING LIQUID DENSITY
Ethell J. Dower, Houston, Tex., assignor to Warren Automatic Tool Company, Houston, Tex.
Filed June 23, 1969, Ser. No. 835,433
Int. Cl. G01n *9/10*
U.S. Cl. 73—452 **10 Claims**



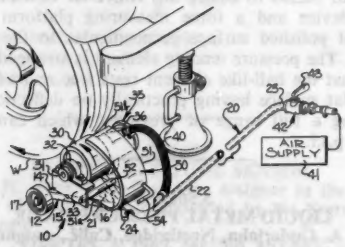
An apparatus for measuring the density of a liquid, as for example the density or mud weight of a drilling mud used for drilling oil wells and the like. It includes a first float arranged for floating in a liquid and a second float supported generally below the first float. Means are interposed between the two floats for sensing changes in the buoyancy force exerted by the second float relative to the first float caused by changes in density of the mud.

3,566,700
CONTROL APPARATUS
Robert C. Staats, Fridley, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Dec. 5, 1966, Ser. No. 599,213
Int. Cl. G01c *19/04*
U.S. Cl. 74—5 **4 Claims**



The present invention pertains to inertial instruments and more particularly to gyroscopes and accelerometers whose inertial members are suspended in electric fields between a plurality of electrodes. Specifically, the present invention provides an improved electric field suspension system based on digital techniques.

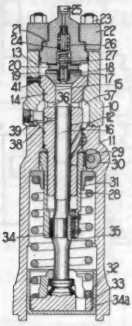
3,566,701
WHEEL SPINNING DEVICES
William E. Hampton, Charlotte, N.C., assignor to Commercial Equipment Company, Inc., Charlotte, N.C.
Filed Nov. 15, 1968, Ser. No. 776,048
Int. Cl. F16m *3/00*
U.S. Cl. 74—16 **2 Claims**



A wheel spinning device for rotating a relatively large and heavy vehicle wheel mounted in position on the vehicle including a rotatable member adapted to frictionally engage the peripheral surface of the vehicle wheel, and drive means for rotating the rotatable member and being capable of delivering torque when operating near a stalled condition at least substantially as great as that delivered when operating at normal speed to overcome

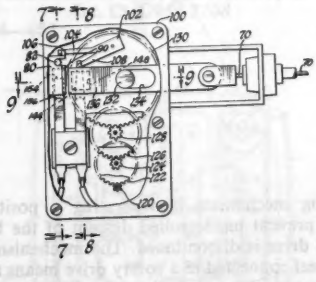
the inertia of a heavy vehicle wheel in a rest condition and to bring the wheel up to a road speed condition without excessive strain on the drive means.

3,566,702
LIQUID FUEL INJECTION PUMPS
Peter F. Cornfoot, Hucclecote, England, assignor to Bryce Berger Limited, Hucclecote, England
Filed Feb. 27, 1969, Ser. No. 802,909
Claims priority, application Great Britain, Mar. 1, 1968, 10,080/68
Int. Cl. F16h *19/04*; F02m *15/00*
U.S. Cl. 74—29 **1 Claim**



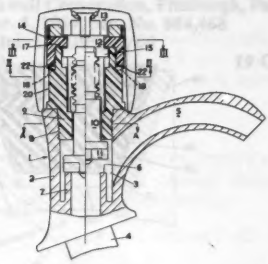
A liquid fuel injection pump including a toothed collar movable angularly to vary the quantity of fuel delivered by the injection pump, a rack bar having a toothed portion for engagement with the teeth of the collar and there is provided at the opposite ends respectively of the toothed portion of the rack bar, curved end forms which are shaped to engage with the crests of a plurality of the teeth of the pinion to limit the extent of axial movement of the rack bar.

3,566,703
LATCH RELEASE OPERATING MECHANISM
Andrew J. Van Noord, Grand Rapids, Mich., assignor to Kent Engineering, Grand Rapids, Mich.
Filed Mar. 28, 1968, Ser. No. 716,959
Int. Cl. B60r *25/02*
U.S. Cl. 74—50 **5 Claims**



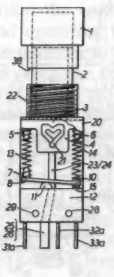
A small electric motor drives a gear train set having a latch retracting link connected to it by an eccentric in a lost-motion slot. The link opens the starting circuit in its retracted position, while a cam switch engaging one of the gears provides a holding circuit. An electrical brake and other interlocking circuit switches are also provided for a steering column latch actuator.

3,566,704
TAP CLOSURE MEMBER OPERATING MECHANISMS
Bernard Arthur Parsons, Walsall, England, assignor to IMI Developments Limited, Birmingham, England
Filed Mar. 20, 1969, Ser. No. 808,795
Claims priority, application Great Britain, Apr. 3, 1968, 16,021/68
Int. Cl. F16h *27/02*
U.S. Cl. 74—89.15 **2 Claims**



A tap closure member operating mechanism with a retaining nut and a head nut, one of which is made from plastics, each nut having a locking portion, the locking portions of the two nuts being in alignment in planes taken normal to the axes of the screw threads when the nuts are assembled together, and during unscrewing of the nuts, the locking portion of the plastics nut is resiliently compressed by the other locking portion so that the locking portions must pass one another and allow the unscrewing action.

3,566,705
PUSH BUTTON KEYS
Emanuel Frydman, West Norwood, London, England, assignor to Telephone Manufacturing Company Limited
Filed Jan. 15, 1969, Ser. No. 791,402
Claims priority, application Great Britain, Feb. 14, 1968, 7,262/68
Int Cl. F16h *21/44, 21/54, 25/18*
U.S. Cl. 74—107 **2 Claims**

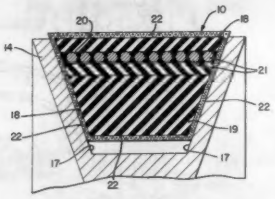


The improved construction of push button switch unit incorporating micro-switch units.

3,566,706
POWER TRANSMISSION BELT
Sidney R. Fix, 517 Jeffery Drive, Lincoln, Nebr. 68505
Filed June 25, 1968, Ser. No. 739,674
Int. Cl. F16g *5/16*
U.S. Cl. 74—233 **1 Claim**

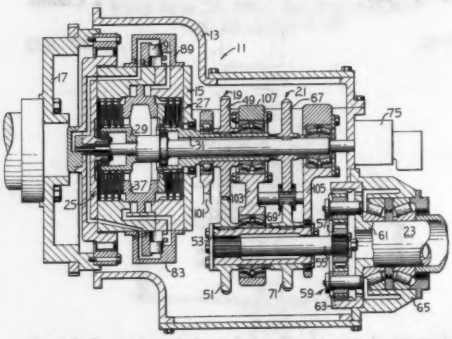
An extensible belt, particularly a power transmission belt, containing a tension section of longitudinally extending individual textile cords which include synthetic ther-

moplastic filamentary material in their structure. The cords are simultaneously relaxed and heat-treated in the absence of applied tension and are thereby capable of an initial stretch or elongation within certain defined limits and a subsequent recovery of at least a substantial portion of the initial stretch. The cords are subsequently incorporated into the belt and the vulcanized belt is thereby made extensible within certain defined limits and capable of being stretched in order to be installed in a belt drive assembly. After the initial stretch, the belt subse-



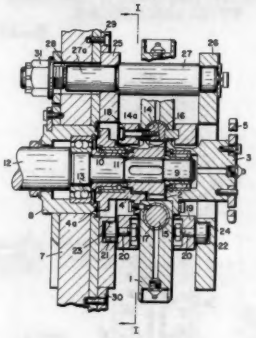
quently retracts or recovers to the driving position with respect to the pulleys and retains sufficient tension to frictionally engage the pulley surfaces and perform its driving function. The self-tensioning belt of this invention eliminates the need for tensioning devices or means to adjust the drive to provide the proper tension required when conventional transmission belts are employed and is particularly useful in applications involving V-type transmission belts which are designed to operate with grooved pulleys or sheaves.

3,566,707
MARINE GEAR
Gunter W. Schulz, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Dec. 12, 1968, Ser. No. 783,358
Int. Cl. F16h *3/14;* F16d *25/10*
U.S. Cl. 74—377 **4 Claims**



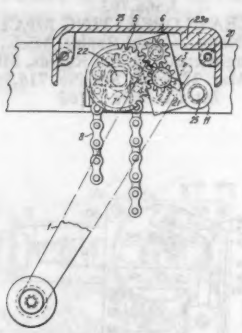
A marine gear having a clutch actuating piston-actuator which is free to rotate within the housing until complete engagement is achieved at which time the housing, piston, and engaged clutch all rotate as a unit. The various shaft bearing support members are secured to the housing of the marine gear so that the shafts may be easily removed with the gears contained thereon to convert the marine gear from one reduction ratio to another, as well as to convert the clutch packs to various torque requirements. A clutch dump valve is contained in a separate housing which is bolted to the clutch housing.

3,566,708
TRANSMISSION PERMITTING CHANGE OF INPUT/OUTPUT RATIO
Walter im Brahm, Mulheim (Ruhr), Germany, assignor to Walter H. Brahm, Mulheim (Ruhr), and Maschinen- und Werkzeugbau G.m.b.H., Dortmund-Hombruch, Germany
Filed Nov. 4, 1968, Ser. No. 773,087
Claims priority, application Germany, Nov. 2, 1967, P 16 50 781.6
Int. Cl. F16h *35/02*
U.S. Cl. 74—393 **13 Claims**



A transmission and, more particularly, a gear drive for changing the speed of rotary motion with or without changing its direction of rotation.

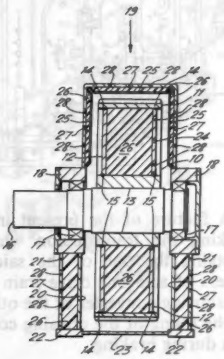
3,566,709
LIFTING MECHANISMS
John Edward Metcalf, 63a Victoria St., Windsor, Berkshire, England
Filed Apr. 28, 1969, Ser. No. 819,800
Int. Cl. B66d *1/76;* F16d *41/24;* F16h *57/10*
U.S. Cl. 74—411.5 **9 Claims**



A lifting mechanism incorporating a positive brake means to prevent uncontrolled descent of the load when the lifting drive is discontinued. The mechanism includes a gear wheel connected to a rotary drive means and meshing with a second gear wheel connected to a rotary hoist member, and a locking member rotatably mounted coaxially with the first mentioned gear wheel and having a spragging gear permanently in mesh with the first mentioned gear wheel and movable with the rotary movement of the first mentioned gear wheel between a locking position when the spragging gear is in mesh with the second gear wheel and a further position in which the spragging

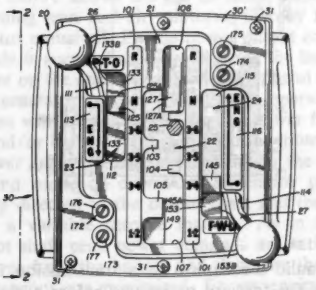
gear is out of mesh with the second gear wheel, movement between the first and second positions taking place when the hoist is caused to rise and movement in the reverse direction taking place when the hoise commences to lower. Catch wheels are provided to maintain the locking member in its second position to allow uncontrolled lowering of the hoist through the rotary drive means. The drive means may be hand operated.

3,566,710
FABRICATED STRUCTURES
Richard A. K. Long, Huddersfield, England, assignor to David Brown Gear Industries Limited
Filed Apr. 1, 1969, Ser. No. 811,786
Claims priority, application Great Britain, Apr. 16, 1968, 17,925/68
Int. Cl. F16f *15/10*; F16h *55/14*
U.S. Cl. 74—443 **4 Claims**



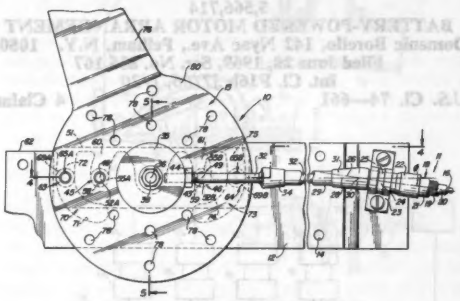
A load-bearing hollow fabricated structure, for example a hollow gear wheel or a cavity-walled gear case, having its interior filled with a rigid plastics material having damping properties. The damping material is bonded to the structure at a myriad of points and carries part of the load applied to the structure as well as reducing noise and vibration.

3,566,711
GATE PLATE INTERLOCK
Dale F. Leuenberger, Cuyahoga Falls, Ohio, assignor to North American Rockwell Corporation, Pittsburgh, Pa.
Filed June 10, 1969, Ser. No. 831,916
Int. Cl. G05g *5/08*
U.S. Cl. 74—483 **8 Claims**



A device for assuring the fail-safe coordination of at least two control systems. A plurality of slidable locking plates are positioned with respect to the gate plate of a control box and are shaped so that effective operation can be achieved only through a selective and sequential movement of the two control levers which, in turn, provides selective and sequential movement of the locking plates.

3,566,712
NONLINEAR CONTROL
Richard D. Houk, Stow, Ohio, assignor to North American Rockwell Corporation, Pittsburgh, Pa.
Filed Mar. 5, 1969, Ser. No. 804,468
Int. Cl. G05g *1/00*
U.S. Cl. 74—491 **19 Claims**

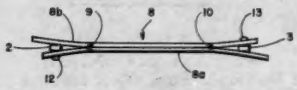


A control for inducing movement to a motion transmitting device as a nonlinear function of the movement applied to the control lever. The working element of a mechanical motion transmitting device is secured to a connector that is rotatably carried on a throw member. The throw member is, in turn, mounted on a frame for swinging movement about selective pivot axes located eccentrically of the axis about which the connector is rotatably carried on the throw member. These axes are parallel and lie within the same reference plane when the control lever, secured to the throw member, is in its neutral position. From this neutral position the control lever is movable through first and second operating ranges, and interlock means restrict the throw member to movement about the axis of one pivot means when the cotnrol lever is within the first operating range, and, similarly, to movement about the axis of the other pivot means when the control lever is within the second operating range. Movement of the throw member about these selective axes, displaced from the axis about which the working element of the motion transmitting device is connected to the throw member, effects transmission of motion by the motion transmitting device that is a nonlinear function of the movement applied to the control lever.

3,566,713
LINK FOR CONTROL LINKAGE
James L. McCarthy, Chili, N.Y., assignor to Sybron Corporation, Rochester, N.Y.
Filed July 16, 1969, Ser. No. 842,127
Int. Cl. G05g *1/24*
U.S. Cl. 74—588 **7 Claims**

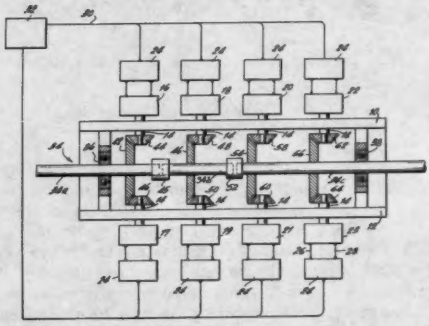
A link consisting essentially of two identical elongated spring laminae, each having a hole therethrough, and sandwiched together along their lengths, overlapping each other and secured together at their intermediate portions, so that said link is longer than either lamina. Each lamina has its said hole in its overlapped end, such hole opening over the surface of the corresponding overlap-

ping lamina end. Corresponding laminae ends are manually forcibly spread apart to receive between them another link having a ball or the like which protrudes into



the corresponding hole. The latter link is sandwiched between the said laminae when the laminae ends are released from manual force spreading them apart.

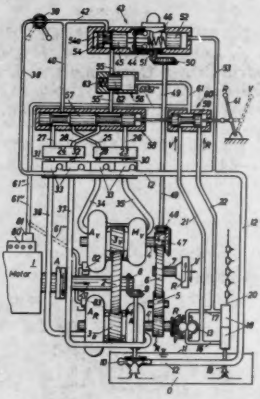
3,566,714
BATTERY-POWERED MOTOR ARRANGEMENT
Domenic Borello, 142 Nyac Ave., Pelham, N.Y. 10803
Filed June 20, 1969, Ser. No. 835,167
Int. Cl. F16h *37/06, 1/20*
U.S. Cl. 74—661 **4 Claims**



A motor arrangement for a car or other such vehicle which is characterized by the use of a plurality of motors, rather than a single motor, each of the motors being readily energized by a commercially available battery of a comparatively small voltage capacity rather than a single, specially built high voltage battery. The use of plural motors additionally enables the use of intermeshing gears of selective tooth ratios to progressively bring the power shaft of the vehicle up to the necessary speed for cruising operation of the vehicle while at the same time enabling each of the motors to operate at its optimum rate of speed. This arrangement, therefore, avoids excessive current drains on the batteries as occurs when a battery-powered motor is operated at other than its optimum or rated speed.

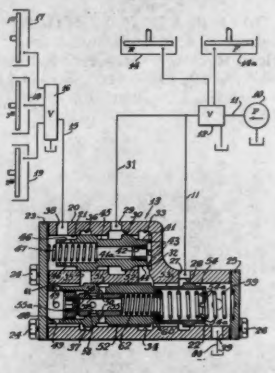
3,566,715
HYDRODYNAMIC TRANSMISSION FOR VEHICLES
Rolf Keller and Traugott Weber, Heidenheim, and Gustav Pistl, Nattheim, Germany, assignors to Voith Getriebe KG., Heidenheim, Germany
Filed Sept. 9, 1968, Ser. No. 767,576
Claims priority, application Germany, Sept. 15, 1967, P 15 80 952.6; July 10, 1968, P 17 55 916.9
Int. Cl. F16d *67/00;* **F16h** *47/00*
U.S. Cl. 74—731 **13 Claims**

The invention concerns a transmission having a unidirectional input shaft and a reversible output shaft and forward and reverse parallel drive trains interconnecting said shafts and each drive train comprising a higher ratio starting fluid flow converter and a lower ratio cruising fluid flow converter. The transmission is started by filling the starting converter of one of said drive trains to drive the output shaft in a respective direction. The transmission goes into cruising by emptying said starting converter and filling the cruising converter of said one drive train at a certain ratio of the speeds of said input and



output shafts. A feature of the present invention is the manner of braking the transmission which is accomplished by emptying the one of the said starting and cruising converters of said one drive train which is filled while filling the starting converter of the other drive train, and preventing the filling of the cruising converter of said other drive train during braking.

3,566,716
CLUTCH CYLINDER CIRCUIT AND CHARGING VALVE THEREFOR
Probir K. Chatterjea, Evanston, Ill., assignor to International Harvester Company, Chicago, Ill.
Filed July 22, 1969, Ser. No. 843,362
Int. Cl. G05g *19/00;* **F01b** *21/00*
U.S. Cl. 74—856 **21 Claims**



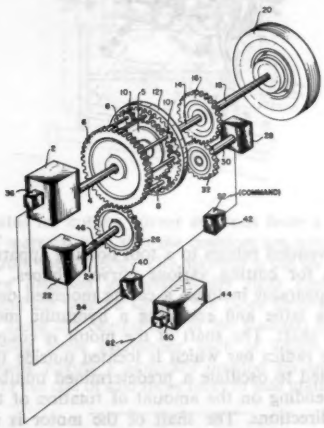
Hydraulic mechanism in a transmission for engaging a clutch for forward or reverse before a clutch for first, second or third speed. Flow of pressure fluid to the latter clutch is by way of a quick-fill spool having a large orifice, a rate-of-rise spool, and a poppet therein having a

small orifice. A restricted orifice of appreciable length is used in connection with the spools and the poppet in such a way that, after the power unit for the clutch for first, second or third speed is filled with fluid, pressure of the fluid in the power unit is slowly raised to its maximum.

3,566,717
POWER TRAIN USING MULTIPLE POWER SOURCES

Baruch Berman, Palos Verdes Peninsula, George Howard Gelb, Torrance, Neal Allen Richardson, Palos Verdes Peninsula, and Tsih C. Wang, Santa Monica, Calif.; said Wang assignor to TRW Inc., Redondo Beach, Calif.

Filed Mar. 17, 1969, Ser. No. 807,870
Int. Cl. B60k *1/04, 21/08;* F16h *37/00*
U.S. Cl. 74—859 **40 Claims**



A power train is described which is comprised of a prime mover, two power converters, an epicyclic gear train, an energy storage device and associated control systems. In the preferred embodiment, the prime mover, an internal combustion engine, typically supplies power to the gear train which apportions mechanical power to one of the power converters—an electrical generator—or to the output shaft of the power train. Power from the generator is delivered to either or both the energy storage device, a battery, and the second power converter, an electrical motor-generator which is dynamically coupled to the output shaft.

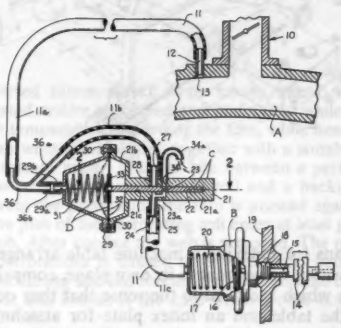
The power train may be operated in one of two modes, in the first, the internal combustion engine runs at constant speed and relatively constant low power. Engine operation of this nature allows the use of small displacement engines burning lean fuel-air mixtures, thereby reducing engine exhaust emissions. Engine power output control in the first mode is accomplished by changing the loading of the generator on the engine in a feedback control manner. The motor-generator is controlled by the operator who uses a system which controls the flow of power from the generator and/or battery combination to the motor or the flow of power from the motor-generator to the battery. In the second mode of operation, all engine power is mechanically directed to the output shaft and the engine operates in a variable throttle manner. As in the first mode, output shaft peak power demands are satisfied by drawing power from the battery and therefore the engine throttle excursions are minimized. Excess engine power and regenerative power due to external forces acting on the output shaft can be transformed in the second power converter for storage in the energy storage device.

In either mode, it is possible to vary the power settings of the engine slowly to reflect the mean power demand on the power train. Typically the state of battery charge would be used as the control variable.

3,566,718
VEHICLE TRANSMISSION CONTROL MECHANISM

Julian H. Wightman, 1005 Pine Forest Drive, Greenwood, S.C. 29646

Filed Apr. 8, 1969, Ser. No. 814,378
Int. Cl. B60k *23/00*
U.S. Cl. 74—863 **4 Claims**

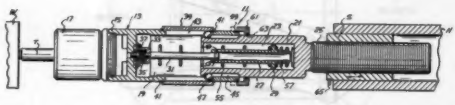


Control mechanism for a vehicle automatic transmission having a fluid pressure responsive modulator therefor includes, a valve having a movable element for opening a port for positively controlling pressure upon the modulator, moved responsive to variation in intake manifold pressure when engine operation calls for an up change.

3,566,719
"NO TOOL" DETECTION SYSTEM AND METHOD

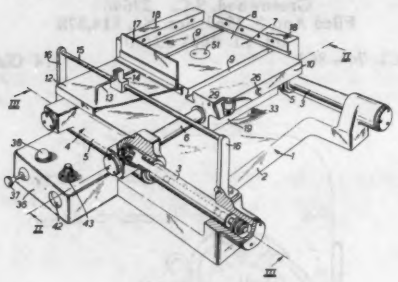
Theodore M. Smith, 14750 Puritan Ave., Detroit, Mich. 48227

Filed Nov. 5, 1968, Ser. No. 773,541
Int. Cl. B23b *47/00;* B23q *11/00*
U.S. Cl. 77—5 **10 Claims**



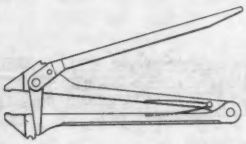
A "no tool," "broken tool" or "improperly set tool" detection device for use with taps, drills, reamers, boring tools, counter bores and milling cutters which includes a tool holder having assembled first and second parts normally biased outwardly of each other, with a radioactive element on one part and a shield upon the other part normally spaced from the radioactive element, and in conjunction with a radiation detection system whereby upon compressive engagement of the tool with a workpiece due to its longitudinal feed, there will be a relative movement of the tool holder parts such as will position said shield to protectively enclose said radiation element, said relative movement being prevented when there is "no tool," a "broken tool" or an "improperly set tool"; and the method of providing said detection system.

3,566,720
INDEXING MEANS
Ernest William Phillips, Coventry, England, assignor to Rutter Tools Limited, Coventry, England
Filed June 10, 1968, Ser. No. 735,855
Claims priority, application Great Britain, July 12, 1967, 31,976/67
Int. Cl. B23b 39/06
U.S. Cl. 77—64 9 Claims



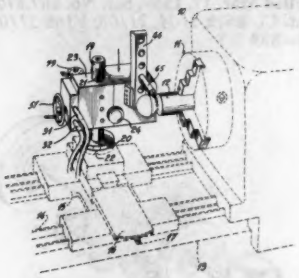
Means for indexing a machine table arranged for two-dimensional movement in its own plane, comprising detent means which are fixed in the sense that they do not move with the table and an index plate for attachment to the table. The plate is formed at specific positions for engagement by the detent means which thereby locate the plate and hence the table in any one of the corresponding index positions so that the table can be securely clamped or locked in position while so located. In a preferred construction of machine table employing the invention the index plate is attached beneath the table and has holes bored at the index positions which are selectively engageable by a pneumatically-operated plunger fixed to a base beneath the table and on which the latter is mounted.

3,566,721
GRIPPING TOOL
Raymond B. Nockleby, Rte. 1, Kalispell, Mont. 59901
Filed Jan. 13, 1969, Ser. No. 790,564
Int. Cl. B25b 7/04
U.S. Cl. 81—384 3 Claims



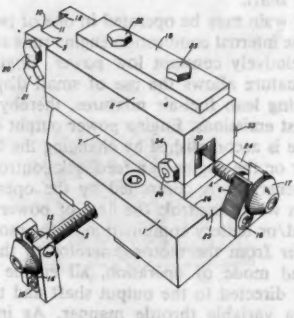
A gripping tool has two jaw members formed with extended arms which overlap and are pivoted together at their ends remote from the jaw members. One of the areas has a post thereon near the pivotal connection of the arms. A spring is helically wrapped around the post and has its ends extending along the arms toward the jaw members and hooked over the arms to urge them apart. Each arm has widened tapered portions adjacent to the jaw members and provided with a plurality of seats in the outer edges. A yoke receives the tapered portions with its base seated in one of the seats in one portion and its sides being extended across both portions. A jaw closing lever is bifurcated to receive the free ends of the yoke and pivot lugs and sockets on the yoke and bifurcations pivot the yoke to the bifurcations. The lever carries a pivot pin which seats in the seats of one tapered portion when the base of the yoke seats in a seat of the other tapered portion.

3,566,722
TOOL HOLDING APPARATUS USED ON LATHES FOR CUTTING VARIOUS CURVED SHAPES
Jean Audet, 1555 Desnoyers St., Sherbrooke, Quebec, Canada
Filed Dec. 3, 1968, Ser. No. 780,822
Int. Cl. B23b 5/40
U.S. Cl. 82—12 11 Claims



This invention relates to a tool holding apparatus used on lathes for cutting various curved shapes. The tool holding apparatus includes a casing mounted on the carriage of a lathe and enclosing a hydraulic motor coupled to a shaft. The shaft of the motor is coupled to an adjustable radius bar which is located outside the casing and adapted to oscillate a predetermined number of degrees depending on the amount of rotation of the motor in both directions. The shaft of the motor is also coupled to a swivel member located outside the casing and used to execute various curved shapes in the interior of a workpiece.

3,566,723
CUTTING TOOL HOLDER
Alfred Carl Oborne, 84 Hopkinson Ave., Piscataway Township, Middlesex County, N.J. 08846
Filed Nov. 7, 1968, Ser. No. 774,093
Int. Cl. B23b 29/10
U.S. Cl. 82—36 4 Claims



A tool holder is disclosed for positioning a cutting tool against a workpiece. The holder includes facilities for adjustment of the tool so that it may be raised or lowered, and moved laterally, longitudinally and angularly with respect to the workpiece.

3,566,724

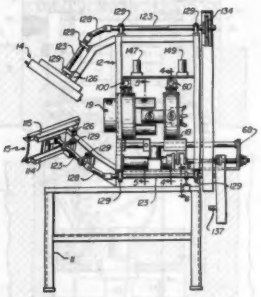
APPARATUS FOR FORMING CORNER CUSHIONS

Phillip A. Templeton, Rte 2, Box 173, Beecher, and John M. Carmody, 12533 Harold Ave, Palos Heights, Ill. 60463

Continuation-in-part of application Ser. No. 770,460, Feb. 26, 1968. This application July 7, 1969, Ser. No. 839,424

Int. Cl. B26d 3/24

U.S. Cl. 83—1 13 Claims



Apparatus for cutting corner cushions from a continuous length of material such that the cushions are not completely severed from the material. The material is cut on three faces which are disposed at substantially right angles to one another and are tapered so that the faces form a point substantially along the central axis of the material by means of three cutting blade assemblies, each of which includes a cutting blade having a generally pointed tip and which is disposed to cut one of said three faces in said material.

3,566,725

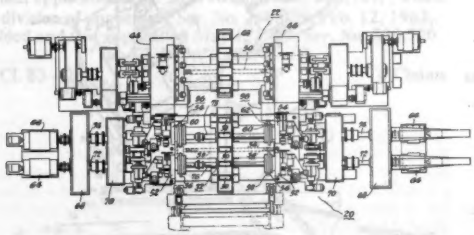
DUAL SHEARING MECHANISM AND METHOD

John J. Sutyak, Pittsburgh, Pa., assignor to Mesta Machine Co., Pittsburgh, Pa.

Filed July 24, 1968, Ser. No. 747,156

Int. Cl. B26d 1/24

U.S. Cl. 83—7 13 Claims



Cutting apparatus including tandemly mounted first and second pairs of juxtaposed knives, each pair of said knives being disposed for passage therebetween of material to be cut, means for urging said first pair of knives against said material when disposed therebetween to score said material, means for mounting said second pair of knives in alignment with the scoring produced by said first pair of knives, and means for urging said second pair of knives toward one another for parting said material at said scoring when said material is disposed between said knives.

3,566,726

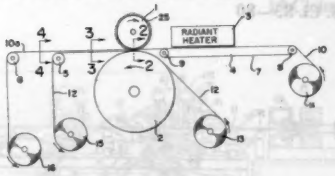
METHOD OF MAKING PERFORATED FILM

George A. Politis, Coatesville, Pa., assignor to The Pantasote Company of New York Inc., New York, N.Y.

Filed June 13, 1968, Ser. No. 736,805

Int. Cl. B26d 7/10

U.S. Cl. 83—15 7 Claims



Unsupported thermoplastic films having elastic memory are perforated and/or embossed and perforated while heated to a plastic temperature by feeding the film, while heated to a temperature where it is plastic, together with a suitable web, such as a release paper, into the bite between a perforating (and/or perforating and embossing) roll and a backing roll, so that during the perforating the film is pressed against the web and the pins of the perforating roll enter at least partway into the web. After cooling the web is removed. The material from the perforations is caused to flow into the balance of the film, thickening and reinforcing the same instead of being punched out and lost as is the case when a cold nonplastic film is perforated.

3,566,727

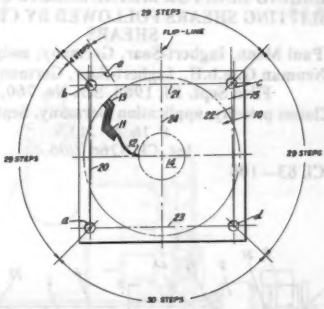
METHOD AND APPARATUS FOR ELECTRIC MOTOR ARMATURES

Bert Weiss, Northport, L. I., N.Y., and Ronald Morino, Glen Cove, N.Y., assignors to Photocircuits Corporation, Glen Cove, N.Y.

Original application Feb. 6, 1967, Ser. No. 614,201, now Patent No. 3,481,033, dated Dec. 2, 1969. Divided and this application July 18, 1969, Ser. No. 858,226

Int. Cl. B26f 1/04

U.S. Cl. 83—50 6 Claims



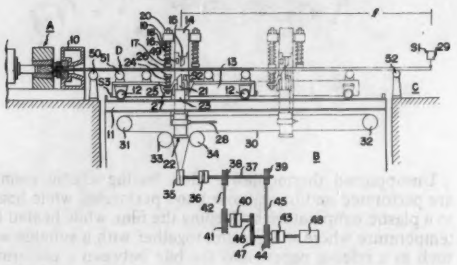
The method of, and punching press for, forming conductor pattern stampings for electric motor armatures. Metal blanks are clamped to a drive shaft by a universal clamp which eliminates eccentricities in rotation. The blanks are indexed and punched at a succession of stamping positions to remove metal between adjacent conductor segments. Alignment holes are punched into the blank at selected stamping positions to establish a flip line used in subsequent assembly operations. The motor armatures are assembled using at least two identical stampings oriented by the alignment holes and the flip lines, bonding the aligned stampings to a dielectric disc, and welding aligned tabs of the stampings to form the armature interconnections.

3,566,728

TRAVELLING CUTTING MACHINE FOR USE WITH AN EXTRUSION PRESS

Atsushi Ohmasu, 1020 Sannoya, Isogo-cho, Isogo-ku, Yokohama-shi, Japan

Filed Dec. 2, 1968, Ser. No. 780,516
Claims priority, application Japan, Dec. 5, 1967, 42/102105
Int. Cl. B26d *1/56*; B23d *25/04*
U.S. Cl. 83—80 3 Claims



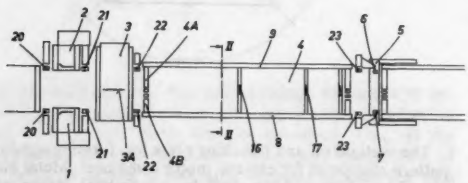
The travelling cutting machine for use with an extrusion press according to the present invention comprises a truck freely movable in the direction in which a continuously manufactured metal rod is carried, a cutter provided with blades for cutting the metal rod carried on the truck, a drive means for causing the truck to travel back and forth, a magnetic clutch or eddy-current coupling motor for coordinating the travelling velocity of the truck with that of the metal rod by connecting or disconnecting the truck with the drive means and a means for operating the truck and cutter by detecting the length of a metal rod continuously drawn out of a manufacturing apparatus, thereby to cut the metal rod by turns to a prescribed length at all times without causing the deformation of the rod.

3,566,729

SHEARING LINE FOR METAL SHEETS COMPRISING SLITTING SHEARS FOLLOWED BY CROSS-CUT SHEARS

Karl Paul Menn, Ingbert-Saar, Germany, assignor to Moeller & Neuman G.m.b.H., Ingbert-Saar, Germany

Filed Sept. 18, 1968, Ser. No. 760,599
Claims priority, application Germany, Sept. 21, 1967, P 16 27 313.5
Int. Cl. B26d *7/06*
U.S. Cl. 83—105 5 Claims



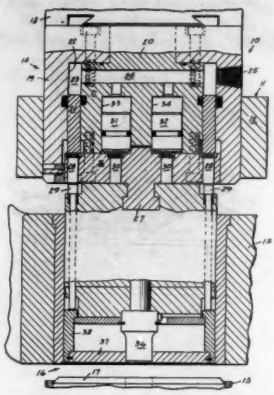
In a shearing line comprising slitting shears (3) for thick sheets two gauges (23) for measuring sheet lengths to be cut are provided in the area of the crosscut shears (5). The gauges are disposed across the width of the sheet and are adapted to operate independent of each other so as to cut a pair of longitudinally divided strips of the sheet simultaneously into equal or different lengths.

3,566,730

PUNCH PRESS HAVING RAM WITH STRIPPING MEANS

James J. Pancook, Tonawanda, N.Y., assignor to Houdaille Industries, Inc., Buffalo, N.Y.

Filed Feb. 25, 1969, Ser. No. 802,098
Int. Cl. B26d *7/18*
U.S. Cl. 83—137 9 Claims



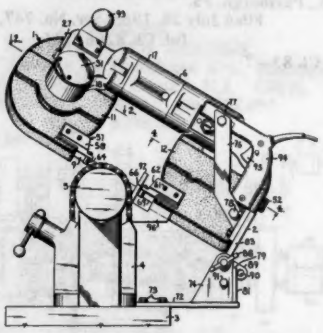
A punch press has a frame receptive of a punch and stripper assembly and a die, and has a ram which includes a number of fluid-pressure biased pistons which act through force transmitting means on the stripper.

3,566,731

BANDSAW, SUPPORT, AND DRIVE MECHANISM THEREFOR

Glover C. Ensley, 420 E. 10th St., North Kansas City, Mo.

Filed Dec. 4, 1968, Ser. No. 781,223
Int. Cl. B26d *1/48*
U.S. Cl. 83—201.14 5 Claims



A bandsaw has a housing enclosing power operated drive means operatively engaging a saw blade driving member spaced from a driven member and an endless blade engaging the driving and driven members. A mounting bracket is secured to the housing and to a support structure and has a support member having spaced ears mounted on and extending upwardly from the support member to pivotally receive an arm secured to the housing. The arm has a planar portion for engaging an abutment portion extending outwardly from the spaced ears for supporting the band saw in a substantially upright position. A motor within the housing rotates a drive shaft having a pinion gear operatively engaging a helical gear on a worm gear shaft whereby same is rotated and a worm

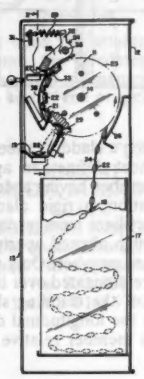
gear thereon operatively engages a helical gear on a driving member shaft whereby the driven member is rotated thereby driving the endless blade.

3,566,732

VENDING MACHINE

Mark Hasten, Indianapolis, Ind.; Lee S. Jones, Berwyn, Pa., and Floyd Lobash, Minneapolis, Minn., assignors to General Mills, Inc.

Filed Jan. 23, 1969, Ser. No. 793,330
Int. Cl. B65h 5/28
U.S. Cl. 83—205 4 Claims



A vending machine using a rotary conveyor to move a strip of individual items from a storage area in the machine to a cutter which severs individual items from the strip as a purchaser purchases the items and operates the vending machine.

3,566,733

APPARATUS FOR FORMING MULTI-PLY TAPE

William G. McClean, Milwaukee, Wis., assignor to The Youngstown Sheet and Tube Company, Boardman, Ohio

Original application Aug. 15, 1967, Ser. No. 660,749, , which is a division of application Ser. No. 258,039, Feb. 12, 1963,. Divided and this application May 1, 1969, Ser. No. 820,720
Int. Cl. B23d 15/04, 15/12
U.S. Cl. 83—282 4 Claims

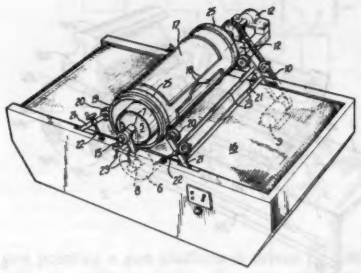
This patent discloses a machine for forming multi-ply tape in which a group of parallel discrete strands of material such as fiber glass are drawn through a station and a crossply laid on the continuous ply being drawn through the machine. If desired, two plys of continuous material may be utilized, with the crossply in between. The tape may be treated with a binder and then dried and coiled.

3,566,734

ROTARY CUTTING OR CREASING MACHINE

Charles Robinson, Henshaw Street Works, Lady Street Entrance, Henshaw Street, Oldham, Lancashire, England

Filed Nov. 19, 1968, Ser. No. 776,911
Claims priority, application Great Britain, Nov. 22, 1967, 53145/67
Int. Cl. B26d 1/28
U.S. Cl. 83—339 19 Claims



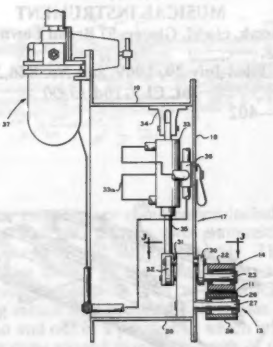
A rotary cutting or creasing machine is disclosed having upper and lower drums between which material to be cut is passed on a conveyor belt, the upper drum being surrounded by a cylindrical sleeve of a diameter greater than the drum and supported by a removable end support in such manner that the sleeve may be withdrawn from one end and replaced by another sleeve.

3,566,735

FIBRILLATION

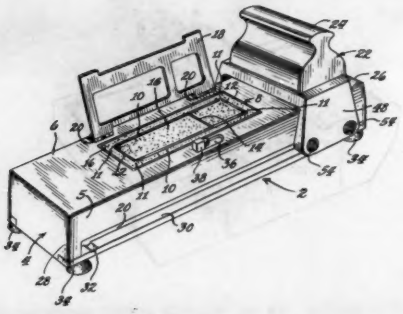
Max E. Greene, Spartanburg, S.C., assignor to Phillips Petroleum Company

Filed Feb. 12, 1969, Ser. No. 798,654
Int. Cl. B26f 3/00, 1/20
U.S. Cl. 83—344 5 Claims



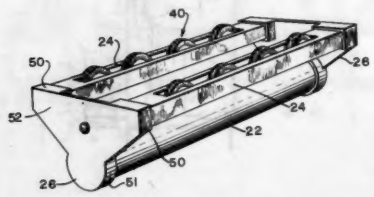
An apparatus for fibrillating a film of thermoplastic material. The apparatus includes a pair of counterrotating rollers having confronting peripheries which define a fibrillating zone. Mechanical means are provided for applying a force on one of the rollers to maintain a predetermined pressure in the fibrillating zone.

3,566,736
SEGMENT CUTTER
Ralph L. Johnson; David M. Beveridge, Wheaton, Ill., and Gene F. Kiela, Kohler, Wis., assignors to Johnson & Quin, Inc.
Filed Apr. 9, 1969, Ser. No. 814,626
Int. Cl. B26d 1/02
U.S. Cl. 83—510 10 Claims



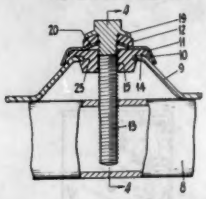
A segment cutter especially suitable for cutting segments from a paper tape such as an encephalogram or electrocardiogram chart which is of compact design and relatively simple in operation. The segment cutter comprises a flat working surface supporting diecutting edges upon which the length of paper is placed and which is held in place by a hinged platen member spring biased into the closed or overlying position with respect to the diecutting edges. A rolling pressure member overrides the entire paper chart or tape supporting surface and is mounted for linear movement through the entire extent of the working surface. The roller member is slightly spaced from the platen surface and when put in rolling contact therewith causes the diecutting edges to pierce the paper supported thereon to cut a segment from the paper web. Other embodiments of the invention are also disclosed.

3,566,737
MUSICAL INSTRUMENT
William Gussak, c/o M. Glazer, 57 Broad Lawn Park, Chestnut Hill, Mass.
Filed July 29, 1969, Ser. No. 846,315
Int. Cl. G10d 13/00
U.S. Cl. 84—402 10 Claims



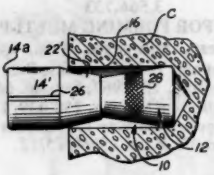
A musical percussion instrument including a container enclosing pellets and a set of jingles, the container and jingles so arranged as to permit selective sound generation from the container and pellets or from the jingles depending upon the directions in which the instrument is shaken.

3,566,738
SEALING MEMBER FOR CLADDING SHEETS
George Moffat Cupit, 77 Crockford Street, Port Melbourne, Victoria, Australia
Filed Nov. 22, 1968, Ser. No. 778,065
Claims priority, application Australia, Nov. 23, 1967, 30216/67
Int. Cl. F16b 35/00
U.S. Cl. 85—1 8 Claims



Apparatus for securing a cladding sheet to a structural support. The cladding sheet defines an aperture for securely receiving a resilient member having a depending boss. In assembling the combination, a rigid clamping plate is positioned to overlie the resilient member in such manner that a fastener can pass through aligned apertures in the clamping plate and in the resilient member. Only the resilient member has its through aperture elongated over its entire depth in the longitudinal direction of the cladding sheet to allow movement in unison and in the longitudinal direction of both the sheet and the resilient member relative to the fastener and the clamping plate.

3,566,739
ANCHORING DEVICE
Charles S. Lebar, Woodcreek Road & Rte. 63, Barrington Hills, Ill.
Filed Feb. 7, 1969, Ser. No. 797,408
Int. Cl. F16b 13/06
U.S. Cl. 85—72 2 Claims

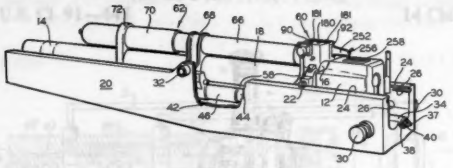


An improved anchor is provided by a single piece that is preshaped to define both an expander and sleeve positioned in endwise relation to each other and interconnected through a connection that is shearable upon bottoming the sleeve on the bottom wall of an aperture and then sharply striking the distal end of the expander to shear said connection and simultaneously telescope the expander into the sleeve. The portion of the sleeve adjacent the shearable connection may be thinned for easier rupture and a portion of the sleeve may be slotted for ease in expansion.

3,566,740
VELOCITY SENSOR FIRING MECHANISM FOR ARTILLERY WEAPONS
Jimmy H. Williams, Bettendorf, Iowa, and Lawrence L. Frauen, Moline, Ill.
Filed May 28, 1969, Ser. No. 828,561
Int. Cl. F41f 13/10, 19/12
U.S. Cl. 89—27 18 Claims

In recoiling guns of the type wherein the firing thereof is accomplished during the forward travel of the recoiling parts,

the problem of compensating for variations in the distance of recoil travel has been solved by a velocity sensor device disposed in the path of the flow of hydraulic fluid between the recuperator and recoil mechanisms and provided with a movable firing piston arranged to be actuated by the hydraulic flow thereagainst upon the attainment of sufficient momentum to overcome the predetermined resistance introduced into an adjustable mechanical linkage arrangement in direct ratio to the size of the propellant charge in the ammunition to be fired.



3,566,741

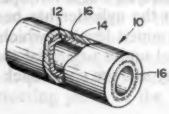
TUBULAR, SEAMLESS, DUAL-HARDNESS ARMOR PLATE

Joseph L. Sliney, 528 Main St., West Concord, Mass.

Continuation-in-part of application Ser. No. 719,386, Apr. 8, 1968, now abandoned. This application June 9, 1969, Ser. No. 831,688

Int. Cl. F16l *9/19*

U.S. Cl. 89—36 **4 Claims**



Seamless, dual-hardness, tubular armor plate is formed from a brittle impact-resistant outer shell metallurgically bonded to a ductile inner shell by coextrusion of the two shells. Central hollow cores of either simple or complex shape are readily formed. The resultant structure has superior resistance to impact as compared to homogeneous cylinders or welded bimetallic cylinders.

3,566,742

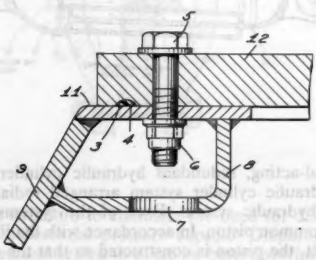
ARMORED VEHICLE HAVING MEANS FOR INTERCHANGEABILITY TOP MOUNTED WEAPONRY

James M. Bemiss, St. Clair Shores, Mich., assignor to Cadillac Gage Company, Warren, Mich.

Continuation-in-part of application Ser. No. 740,961, June 28, 1968. This application Aug. 27, 1969, Ser. No. 858,251

Int. Cl. F41h *7/12*

U.S. Cl. 89—40 **1 Claim**



An armored vehicle with an open-top hull design to provide interchangeability of optional top mounted armored weapons or equipment.

3,566,743

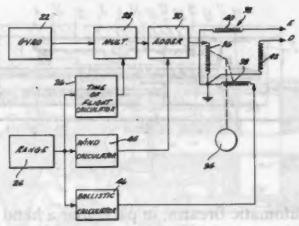
KINEMATIC DEVICE FOR FIRE CONTROL AGAINST TERRESTRIAL TARGETS WITH SINGLE RATE SENSOR

Millard M. Frohock, Jr., Thousand Oaks, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 21, 1968, Ser. No. 754,408

Int. Cl. F41g *5/16, 1/00, 3/10*

U.S. Cl. 89—41 **5 Claims**



In gun pointing a gun platform is driven by a tracker, but especially in military tanks, the gun platform is rarely horizontal. Accordingly, an elevational correction is necessary in addition to an azimuthal correction to lead a substantially horizontally moving target. The present device uses a single rate sensor to sense the azimuthal rate of the gun platform and a gravity sensor to detect the angle by which the gun platform is off of horizontal. The gravity sensor takes the form of a resolver which accepts the rate information to provide elevational and azimuthal gun pointing correction on such targets.

3,566,744

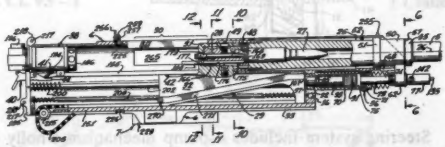
AUTOMATIC GUN RECEIVER COMBINATION

Eugene M. Stoner, Rte. 1, Box 70, Port Clinton, Ohio

Continuation of application Ser. No. 763,449, July 22, 1968, now abandoned , which is a division of application Ser. No. 491,300, Sept. 29, 1965, now Patent No. 3,455,204. This application July 14, 1969, Ser. No. 854,005

Int. Cl. F41d *5/02, 11/12*

U.S. Cl. 89—125 **11 Claims**



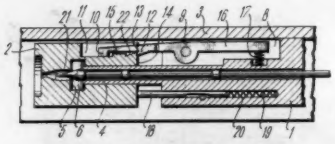
The automatic gun receiver combination includes a recoiling barrel, bolt and bolt carrier, two ammunition feeding means, recoil assembly and buffer assembly. The recoiling barrel reciprocates axially in the receiver forwardly of the ammunition feeding means. A bolt is reciprocated axially past the feeding means by a recoiling bolt carrier. The bolt is also rotated into and out of a position in which it is locked to the barrel. Two cams extend along the length of the bolt carrier to cooperate with cam followers on each of the two ammunition feeding means, either of which may be selected to feed ammunition into the receiver. The recoil assembly is coupled between the barrel and receiver both for buffering recoil and counterrecoil of the barrel and for accelerating the bolt carrier in recoil relative to the barrel. The buffer assembly at the rear of the receiver both buffers the recoil force of the bolt and bolt carrier and mounts a sear, selectively engageable with the bolt carrier, such that when the sear and bolt carrier are engaged, the resulting interruption of the counterrecoil of the bolt and bolt carrier is buffered.

3,566,745

AUTOMATIC FIREARM BIPARTITE SEMIRIGID BOLT

Stanly Jauch, Weiden uber Horb, and Herbert Meidel, Oberndorf, Germany, assignors to Heckler & Koch GmbH, Oberndorf (Neckar), Germany

Filed Oct. 25, 1968, Ser. No. 770,648
Claims priority, application Germany, Oct. 28, 1967, P 15 78 392.3
Int. Cl. F41d 1/00, 3/00
U.S. Cl. 89—187 11 Claims



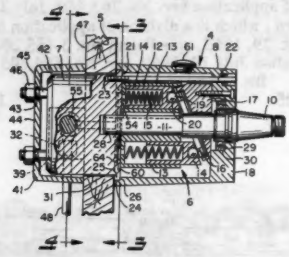
An automatic firearm, in particular a hand firearm or small arm, with a semirigid bolt having a bolt head carrier provided with a camming piece and a bolt head disposed on the camming piece so as to be movable within certain limits in the longitudinal direction of the bolt. At two diametrically opposed points of the bolt, recesses are provided for accommodating locking members in the form of locking rollers which can be pushed outward by the camming piece to a point where they are free to leave the recesses of the bolt head in an outward direction and to enter into corresponding recesses in the barrel extension of the firearm.

3,566,746

HYDRAULIC STEERING SYSTEM FOR BOATS

Robert R. Harrison, Elyria, Ohio, assignor to Nemo Corporation, Cleveland, Ohio

Filed Apr. 29, 1969, Ser. No. 820,222
Int. Cl. F04b 1/02
U.S. Cl. 91—6.5 11 Claims



Steering system includes a pump mechanism wholly contained within the steering wheel shaft mount in front of the dash panel, with a porting plate protruding behind the mounting plate to a slight extent sufficient to provide room for connection of fittings thereto and attachment of the steering system to the dash panel.

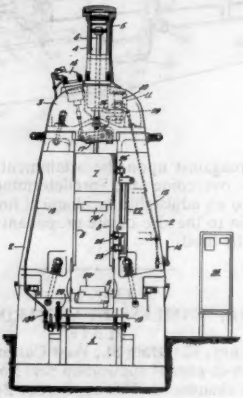
3,566,747

SELF-REGULATING EXPANSION TYPE CONTROL VALVE

Charles W. Frame, Chambersburg, Pa., assignor to Chambersburg Engineering Company, Chambersburg, Pa.

Filed Feb. 14, 1969, Ser. No. 799,277
Int. Cl. F15b 21/02
U.S. Cl. 91—35 13 Claims

The lifting of a drop hammer is controlled by a spool-type valve admitting compressed air into the main cylinder of the hammer. In order for compressed air to be admitted the valve spool is forced from its normal position exhausting the cylinder into a position supplying compressed air to the main cylinder by admitting control air into a region in which its pressure moves the spool against opposition by a spring. After compressed air has been admitted to the main cylinder, at a preselected control position, the control air is exhausted. A slide in the valve is then moved toward the spool and into a stop by air pressure from the cylinder. The spring returns the spool part way toward normal position until it contacts



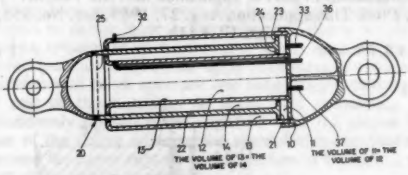
the slide, in which position the cylinder is closed off from the supply of compressed air but is not opened to exhaust. When the air pressure in the cylinder has been reduced by expansion to a predetermined level at which most of its energy is extracted the spool under urging of the spring will push the slide out of the way and the spool back to position to exhaust the cylinder.

3,566,748

DUAL-ACTING, REDUNDANT, HYDRAULIC CYLINDER ARRANGEMENT FOR AIR AND SPACECRAFT

Edmund Norbert Mahler, Landham-West, Germany, assignor to Entwicklungspring Sud G.m.b.H., Munich, Germany

Filed Aug. 19, 1968, Ser. No. 753,659
Claims priority, application Germany, Aug. 31, 1967, E34700
Int. Cl. F01b 7/00
U.S. Cl. 91—411 3 Claims

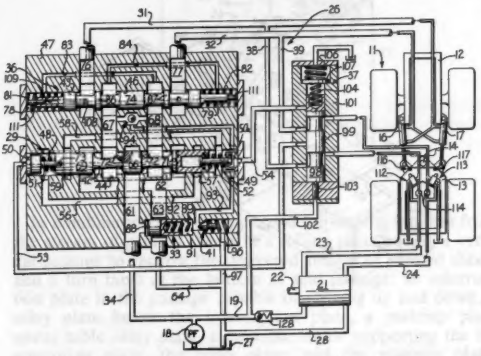


A dual-acting, redundant hydraulic cylinder including a first hydraulic cylinder system arranged radially around a second hydraulic system. Each of the systems is provided with a common piston. In accordance with the illustrated embodiment, the piston is constructed so that the working area associated with the first hydraulic system is approximately equal to the working area defined by the second hydraulic system.

3,566,749
HYDRAULIC FLOW AMPLIFIER VALVE

Thomas E. Allen, East Peoria; Gordon W. Johnson, Joliet; Richard L. M. Sears, Washington; Chester L. Strantz, East Peoria, and John B. Waggoner, Joliet, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 13, 1968, Ser. No. 712,747
Int. Cl. F15b *11/08, 13/042*
U.S. Cl. 91—445 14 Claims

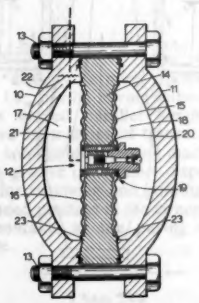


A hydraulic flow amplifier valve assembly for regulating fluid flow to steering jacks. A steering control valve receives fluid directly from a pump and is pilot operated by fluid from a conventional metering unit to provide amplified flow of pump fluid to the jacks. A blocker valve passes fluid from the steering valve during steering motion of the jacks and otherwise isolates the jacks to prevent fluid loss. A lock valve protects against steering wheel slippage during overpressure conditions and also permits pilot fluid provided by the metering unit to operate the steering jacks in the event of pressure failure.

3,566,750
DIFFERENTIAL PRESSURE CELL WITH KEYSTONE STRUCTURE

Albert Allen, Sharon, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed Mar. 10, 1969, Ser. No. 805,495
Int. Cl. F01b *19/02*
U.S. Cl. 92—48 1 Claim

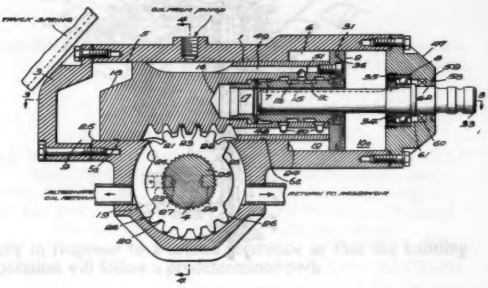


A keystone structure to eliminate the need for diaphragm welding in a differential pressure capsule. Diaphragms are securely locked and sealed in place by bolts applying joining pressure to diaphragm periphery in a ring keystone structure. This structure provides a mechanical seal diaphragm mounting with tapered lock-in structure which prevents significant slippage during overrange.

3,566,751
POWER STEERING GEAR

Richard H. Sheppard, 101 Philadelphia St., Hanover, Pa.

Continuation of application Ser. No. 690,964, Dec. 15, 1967, now abandoned. This application Aug. 12, 1969, Ser. No. 852,530
Int. Cl. F01b *9/04*
U.S. Cl. 92—136 8 Claims

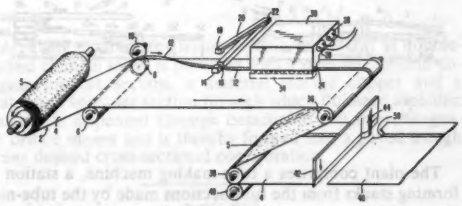


A power steering apparatus wherein an offset piston is slidable within a stepped cylinder to provide a more compact design. The piston is in slidable engagement with the cylinder on both sides of the driving rack whereby the return chamber enclosing the driven pinion and said rack is subject only to return pressure. The operating end of the body of said piston is cut back opposite said pinion for further compactness and said pinion is provided with alternate sets of teeth and reduced lands for cooperation with said rack and the sealing area of said piston, respectively. The body of said piston is made separate from the enlarged disc and detachably mounted thereon.

3,566,752
METHOD OF FORMING A TEAR STRIP ON A PACKAGING SHEET

Hans C. Dreher, Dallas, Pa., assignor to General Cigar Co. Inc., New York, N.Y.

Filed Aug. 12, 1968, Ser. No. 751,967
Int. Cl. B31d
U.S. Cl. 93—1 1 Claim



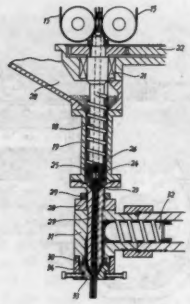
This invention relates to the formation of a tear strip on a packaging sheet having a surface which is heat or pressure sealable. By trimming a narrow strip from the packaging sheet and sealing the trimmed strip to the surface of packaging sheet, a packaging sheet with an affixed tear strip of the same sheet material is produced.

3,566,753

METHOD AND APPARATUS FOR PRODUCING FILTERS FOR CIGARETTES

Joachim Mantke, Meiningenallee 5, Berlin 19, Germany

Filed Sept. 25, 1968, Ser. No. 762,585
Claims priority, application Germany, Sept. 28, 1967, P 16 32 243.3
Int. Cl. B31b *49/00*; B31d *5/00*; B31b *7/74*
U.S. Cl. 93—1 3 Claims



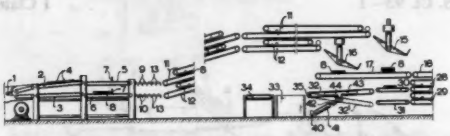
Method and apparatus for producing filters for cigarettes in which a chamber containing a flowable pulverulent effective filter material inside a sheath enveloping the entire filter is closed at each end by a plug of permeable material which likewise has a filtering effect.

3,566,754

PLANT FOR MAKING BAGS

Willi Stork, Tecklenburg; Walter Franke, Weddel; Ewald Fischer, Braunschweig; Karl Haupt, Wolbeck, and Werner Hassman, Lengerich, Germany, assignors to Windmoller & Hoischer, Westphalia, Germany

Filed May 16, 1968, Ser. No. 729,815
Claims priority, application Germany, May 22, 1967, W44023
Int. Cl. B31b *1/00*
U.S. Cl. 93—8 18 Claims



The plant comprises a tube-making machine, a station for forming stacks from the tube sections made by the tube-making machine, a conveyor and a distributor for delivering the stacks to preferably two or more end-laying machines, and a device for removing the stacks of bags made by the end-laying machines. A storage device is disposed between the stack-forming device and the distributing station and serves to receive the stacks of tube sections and to deliver them to the distributing station as required, automatically and independently of the delivery speed and delivery timing of the stack-forming device.

ERRATUM

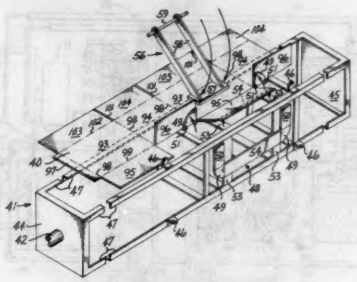
For Class 93—44.1 see:
Patent No. 3,566,762

3,566,755

APPARATUS FOR ERECTING CARTONS

Barton K. Smith, Winnetka, Ill.; Ralph W. Groff, Sr., Cherry Hill; James B. Rodman, Sr., Burlington; Henry F. Orzechowski, Lindenwold, and Joseph S. Hartle, Sr., Moorestown, N.J., assignors to Weyerhaeuser Company, Tacoma, Wash.

Original application Dec. 28, 1966, Ser. No. 605,321. Divided and this application Jan. 14, 1969, Ser. No. 810,886
Int. Cl. B31b *1/26*
U.S. Cl. 93—49 5 Claims



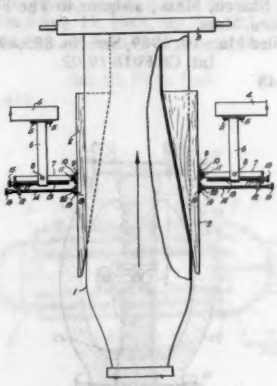
An apparatus and method for packaging articles of variable height. The articles are stacked and the height measured. A half-slotted container is then cut to size and scored and slotted. The blank is partially erected and the articles placed into the container through an open side. The container is then closed.

3,566,756

GUSSETER GUIDE

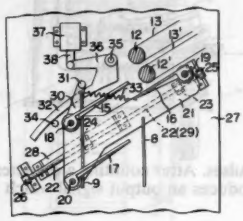
Richard G. Schmid, Osgood, and James H. Champer, Greensburg, Ind., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Jan. 10, 1969, Ser. No. 790,419
Int. Cl. B31b *45/00*, *41/26*; B31c *5/00*
U.S. Cl. 93—84 4 Claims



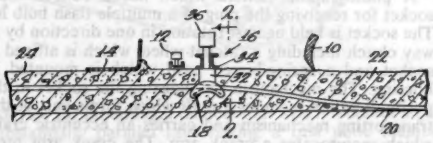
A gusset is put into a bubble of blown film just before the film is flattened from a bubble by the pinch rolls by means of a gusseter guide sled which is shaped like a wedge in both lateral and transverse directions. The sled is positioned by a novel apparatus which controls depth of penetration of the sled into the bubble of blown film, and the angle of the sled in the film in both the transverse and lateral direction.

3,566,757
APPARATUS FOR MAKING BUNDLES FROM THE STREAM OF PRINTED SHEETS IN ROLLING PRESS
Yuji Fujishiro, 6 of No. 3 Fukozawa, 1-chome, Setagaya-ku, Tokyo, Japan
Filed July 23, 1969, Ser. No. 843,962
Int. Cl. B65h *33/00*
U.S. Cl. 93—93 2 Claims



In combination with an apparatus for making bundles from the stream of printed sheets in a rolling press having a vertical passage to receive the delivered stream of printed sheets and a turn table at the bottom of said passage, an interruption plate in the passage capable of rocking up and down, a relay plate below the interruption plate, a makeup plate under table relay plate, a movable frame supporting the interruption plate, the relay plate, and the makeup plate, means to move the frame forwardly and rearwardly across the passage along a straight line settled at an angle to the passage, and means to control the rocking motion of the interruption plate and the motion of the frame for a prescribed period and manner by signals from a counter head provided at the delivery end of the stream of printed sheets.

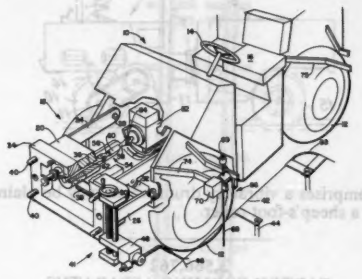
3,566,758
CONTINUOUSLY REINFORCED CONCRETE PAVING APPARATUS
Glen E. Perkins, 1428 40th Ave., Rock Island, Ill.
Filed Apr. 29, 1969, Ser. No. 820,214
Int. Cl. E01c *19/00*
U.S. Cl. 94—39 7 Claims



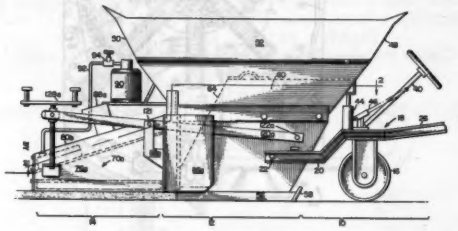
Apparatus for directly forming continuously reinforced concrete paving, i.e., paving having imbedded therein essentially continuous spaced parallel longitudinal reinforcing rods, characterized by a series of transversely spaced members carried by a conventional paving machine and each having a rod guiding groove or channel disposed longitudinally of the road site for receiving and guiding a reinforcing rod into its final intended position in the concrete mass, both vertically and horizontally, as the paving machine advances along the road site.

3,566,759
MOUNTING ARRANGEMENT FOR SIDEWALK BUILDING EQUIPMENT OR THE LIKE
Raymond A. Gurries, San Jose, Calif., assignor to Gurries Manufacturing Co., San Jose, Calif.
Filed Dec. 17, 1968, Ser. No. 784,402
Int. Cl. E01c *19/48*
U.S. Cl. 94—46 10 Claims

Mounting arrangement for sidewalk or road building equipment, such as graders, spreaders and pavers, which provides replaceable mounting of a selected unit from a mobile frame for height, cross slope and lateral adjustment automatically in response to a sensed reference so that the building operation will follow a predetermined path.



3,566,760
APPARATUS FOR FORMING PAVED CHANNELS
Napoleon G. Lafleur, 20 L'Homme St., and Roger F. Lafleur, Windham Road, Danielson, Conn.
Filed Mar. 13, 1969, Ser. No. 807,002
Int. Cl. E01c *19/48*
U.S. Cl. 94—46 6 Claims

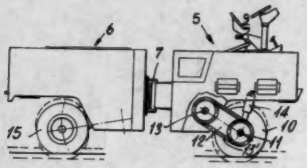


A paving machine for laying asphalt, preferably in double-curbed channel form, is provided with a steerable ground-engaging support section, a material storage hopper and a heater and spreader section through which fluidized asphaltic material is dispensed through detachable and interchangeable orifice means and is thereby formed into a paved trough of any desired cross-sectional configuration.

3,566,761
GROUND-TAMPING MACHINE MADE OF A TOWING UNIT MOUNTED ON RUBBER WHEELS AND OF A TOWED TAMPING UNIT
Domenico Domenighetti, Via Nosetto 6, 6500 Bellinzona, Switzerland
Filed Feb. 5, 1969, Ser. No. 796,822
Claims priority, application Switzerland, Feb. 7, 1968, 1992/68
Int. Cl. E01c *19/24*
U.S. Cl. 94—50 4 Claims

A ground-tamping machine comprises a tractor unit and a trailer unit. The tractor unit is mounted on at least three rubber-tired wheels that are axially aligned and supported singly or in pairs on arms that are maintained at an adjustable

angle by fluid motors. A fluid motor interconnects the tractor and trailer for relative horizontal swinging movement. The

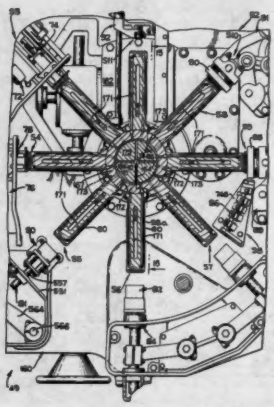


trailer comprises a vibratory drum which may be plain cylindrical or a sheep's-foot roller.

3,566,762
CARTON-FORMING APPARATUS

Leslie Vadas, Los Gatos, and Robert W. Drake, San Jose, Calif., assignors to FMC Corporation, San Jose, Calif.

Original application June 7, 1965, Ser. No. 461,738, now Patent No. 3,456,419, dated July 22, 1969. Divided and this application Mar. 11, 1968, Ser. No. 711,967
Int. Cl. B31b *1/02*
U.S. Cl. 93—44.1 **24 Claims**



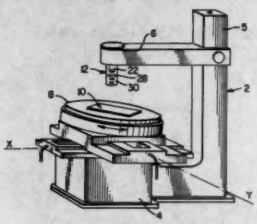
Carton-forming apparatus which is adjustable to handle thermoplastic cartons of different sizes. A plurality of adjustable mandrels on an intermittently driven turret receives folded carton blanks from a magazine with the bottom closure flaps projecting outward of the mandrels. The intermittently driven turret then moves the cartons past apparatus wherein thermoplastic material on the bottom closure flaps is heated to a bonding temperature, the flaps are folded to a closed position, sealing pressure is applied to the flaps, and the cartons with the flaps sealed are stripped from the mandrels.

3,566,763
DISPLACEMENT RESPONSIVE APPARATUS FOR PRODUCING PATTERNS ON A PHOTOSENSITIVE SURFACE

George S. Knopf, Dayton, Ohio, assignor to The Bendix Corporation

Filed June 5, 1968, Ser. No. 734,752
Int. Cl. G03
U.S. Cl. 95—1 **7 Claims**

An apparatus for producing uniform patterns on a photosensitive surface by triggering a light source at intervals determined by the change in displacement of the photosensitive surface relative to the light source. The light source illuminates a predetermined portion of the surface at intervals determined by the change in displacement of the photosensitive surface relative to the light source. A counting mechanism receives an electrical pulse for each equal increment of movement between light source and surface and

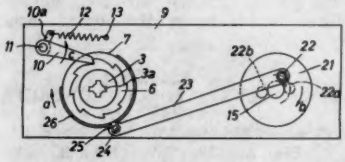


counts the pulses. After counting a predetermined number of pulses, it produces an output signal which activates the light source.

3,566,764
DRIVE MECHANISM FOR ROTATABLE FLASH ATTACHMENT

Dieter Maas, Munich; Richard Schmierl, Uterhaching near Munich, and Guenter Heidrich, Munich, Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 21, 1968, Ser. No. 715,058
Claims priority, application Germany, Mar. 31, 1967, A55314
Int. Cl. G03b *19/00*
U.S. Cl. 95—11 **9 Claims**



A photographic camera which has a built-in indexible socket for receiving the plug of a multiple flash bulb holder. The socket is held against rotation in one direction by a one-way clutch including a ratchet wheel which is affixed to the socket and a spring-biased pawl which is mounted in the housing. The mechanism for indexing the socket in the opposite direction includes a shaft which forms part of the film transporting mechanism and carries an eccentric crank pin which reciprocates a crank arm. The crank arm turns the socket in the opposite direction by way of a friction coupling including a cylinder coaxially affixed to the socket and a leaf spring which engages and partially surrounds the peripheral surface of the cylinder and is connected to one end of the crank arm.

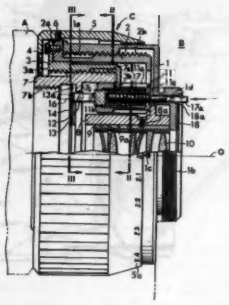
3,566,765
A DEVICE FOR CONTINUOUSLY ALTERING THE FOCAL LENGTH OF PHOTOGRAPHIC LENSES

Motoi Nagashima, Tokyo-to, Japan, assignor to Shima Kogaku Kabushiki Kaisha, Tokyo-To, Japan

Filed Aug. 27, 1968, Ser. No. 755,665
Claims priority, application Japan, Dec. 31, 1967, 43/200
Int. Cl. G02b *7/10*
U.S. Cl. 95—45 **1 Claim**

A device for continuously altering the focal length of photographic lenses, which is detachably mounted between the camera body and the objective lens unit containing a diaphragm means and which comprises an operating ring means capable of continuously altering the focal length of the objective lens system or, in other words, the magnification of the objective lens system by a mere rotation of said operating ring means causing said objective lens unit to be driven forwardly or backwardly in the direction of the optical axis of said objective lens system and a built-in diaphragm ac-

tuating rod means capable of making telescopic movement in accordance with the forward or backward movement of said objective lens unit, whereby effecting the automatic operation of the diaphragm means in interlocking relation with the operation of the shutter button which is provided on the camera body, regardless of whichever focal length adjusting position occupied by said operating ring means.

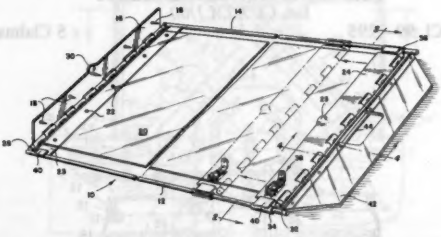


3,566,766

MOUNTING DEVICE FOR FLEXIBLE FILM

Forrest Ashton Wessells, Baltimore, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Nov. 29, 1968, Ser. No. 779,667
Int. Cl. G03d *3/00*
U.S. Cl. 95—100 3 Claims



A device for mounting a flexible film which includes a pair of substantially parallel rails having a first plate member disposed near one end with stud elements disposed along the base thereof and projecting substantially parallel to each other. A second plate member is oppositely disposed to the first plate member and is positioned along the rails, with the second plate member having stud elements disposed along the base thereof and projecting substantially parallel to each other. Bar elements are disposed in association with the first and second plate members forming a pivotal clamping arrangement, and a handle element is mounted transverse the rails. A flexible film may be mounted between the first and second plate members by the stud members projecting therethrough.

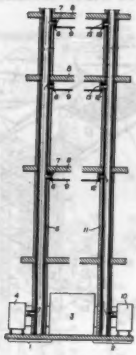
3,566,767

AIR VENTILATING OR AIR CONDITIONING SYSTEM

Paul Odelga, 17 Nedergasse, 1190 Vienna, Austria

Filed Oct. 9, 1968, Ser. No. 766,254
Claims priority, application Austria, Oct. 11, 1967, A9194/67
Int. Cl. F24f *7/00*
U.S. Cl. 98—31 4 Claims

An air conditioning system for a building structure having several floors and which is provided with a ducting work having a horizontal main duct to which are connected at least two vertical distributing ducts is improved by making the vertical distributing ducts of equal cross section throughout their entire length. At least some of the floors are provided with openings which are in communication with said vertical ducts and serve for supplying and exhausting air respectively. Said openings are provided with selectively applicable closure caps.

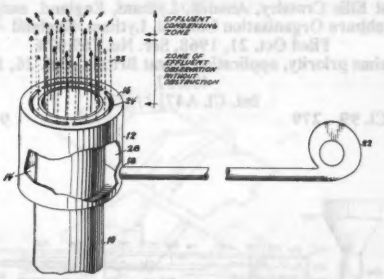


3,566,768

STACK-JET CURTAIN

Robert H. Walpole, Jr., Wellsville, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed Jan. 22, 1969, Ser. No. 793,118
Int. Cl. E04f *17/02*
U.S. Cl. 98—58 2 Claims



An apparatus permitting observation of the true nature of effluent gas traversing a stack. The apparatus is instrumental in forming an air curtain around the outlet end of the stack where the exhaust gases traversing the stack are emitted from the restrictive closure of the stack to the atmosphere. An air curtain so produced creates a transparent barrier that separates the hot moisture bearing effluent gases of the stack from the cooler air of the surrounding atmosphere to delay cooling the gases passing up through the exhaust stack until they pass beyond the air curtain and are discharged to the atmosphere. Delay in cooling the effluent gas prevents it from condensing as visible clouds and thus permits observation at this point to present a true appearance of the effluent.

3,566,769

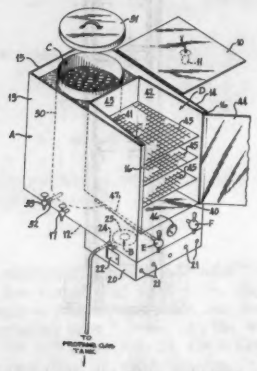
COMBINED FOOD WARMER AND BEVERAGE DISPENSER

Richard H. LeFever, 1129 Highland Ave., Chester, Pa.

Filed Sept. 10, 1969, Ser. No. 856,677
Int. Cl. A47j *31/00*
U.S. Cl. 99—288 5 Claims

A combined food warmer and beverage dispenser includes a generally parallelepipedal boiler, adapted to contain water, and associated means to heat the water. Suspendedly mounted in one end of the boiler and kept warm by the water

therein are one or more beverage urns. The other end of the boiler contains a food warming chamber, extending into the boiler and jacketed by boiler water, said chamber including an access opening occupying most of the face of this end of the boiler. The same face which contains the access opening

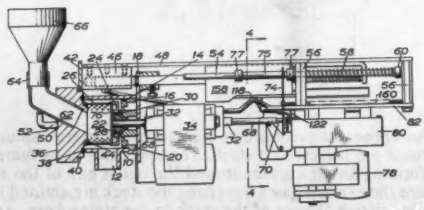


also contains a plurality of dispensing valves. One of these valves drains hot water from the interior of the boiler for beverage use. Another valve is connected to a beverage urn and drains previously prepared hot beverage from it. Thus, a user standing at one location can obtain hot beverage, hot water and/or warm food.

3,566,770
APPARATUS FOR INFUSING TEA, COFFEE AND THE LIKE

Ernest Ellis Crossley, Ansdell, Lytham, England, assignor to Ditchburn Organisation Limited, Lytham, England

Filed Oct. 21, 1968, Ser. No. 769,074
Claims priority, application Great Britain, Oct. 26, 1967, 48,637
Int. Cl. A47j *31/22*
U.S. Cl. 99—279 **9 Claims**



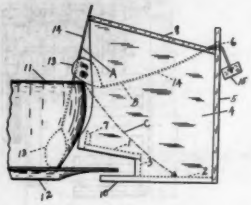
An apparatus for infusing a single unit serving of a beverage such as coffee wherein dry ingredients and hot liquid are fed to a chamber at least part of a wall of which is pervious to liquid, the chamber is rotated about a horizontal axis to infuse the beverage and force it outwards through the pervious wall of the chamber under the influence of centrifugal force, and the spent ingredients are discharged from one end of the chamber as by a piston disc movable relative to the chamber.

3,566,771
TEA BAG DISPOSERS

Louis W. Rosen, New York, N.Y. (2018 North Bay Road, Miami, Fla. 33140)

Filed Jan. 2, 1969, Ser. No. 788,442
Int. Cl. A47j *31/48*
U.S. Cl. 99—290 **7 Claims**

My invention relates to a self-contained disposer, with compartment therein, for transfer thereto, without spillage en route, of a plurality of stringed tea bags from cups of diverse heights, stationed alongside of it either in or out of a saucer, said compartment having its highest reach at the portal thereof for admittance therethrough of such bags from said

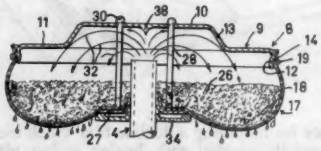


variety of cups while preserving, through compensating means, a depth throughout the same no less than that at said portal; for deposit therein of such bags, with means for the continuous guidance of such string during the process of such transfer.

3,566,772
DISPOSABLE COFFEE CONTAINER

Herbert Albert Oliver, 2814 Steinhart Court, Santa Clara, Calif., and Ernest L. McDonald, 4197 Lemoyne Way, Campbell, Calif.

Filed Aug. 3, 1967, Ser. No. 658,100
Int. Cl. A23f *1/00*
U.S. Cl. 99—295 **5 Claims**



A disposable beverage making package adapted for quick positioning on and removal from the upper open end of the conventional central water riser tube of a percolator on which tube the package is solely supported in the upper portion of the percolator by its engagement with the upper end portion of the riser. All water is ejected from the unobstructed open upper end of the riser into the package and is uniformly distributed over the bed of ground coffee around the riser for passage through the porous support for said bed into the coffee container.

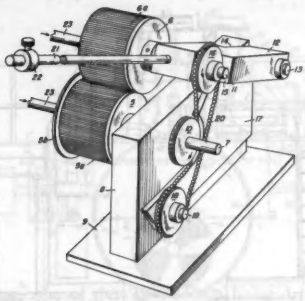
3,566,773
BACON COOKING DEVICE

George A. Chadwick, Jr., Boyds, Md. (5100 Wisconsin Ave. N.W., Washington, D.C. 20016)

Filed Feb. 11, 1969, Ser. No. 798,281
Int. Cl. A47j *37/04*
U.S. Cl. 99—349 **6 Claims**

A bacon cooking device consisting of two or more coacting metal rollers between the peripheries of which strips of bacon are fed. The rollers are heated by gas or electricity and

are power driven so that the bacon is automatically cooked as it is fed between the rollers. The device includes means for



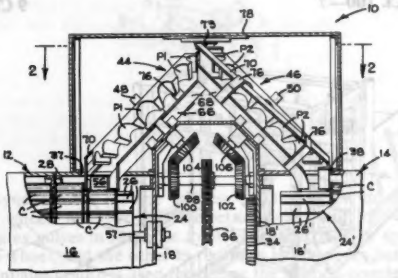
applying a regulated, peripheral contact pressure between the heated rollers so as to facilitate cooking.

3,566,774

CONTAINER TRANSFER MECHANISM

Samuel A. Mencacci, Wilrijk, Antwerp, Belgium, assignor to International Machinery Corporation, S. A., St. Niklaas-Waas, Belgium

Filed Nov. 14, 1968, Ser. No. 775,675
Int. Cl. A23l *3/02*
U.S. Cl. 99—361 **9 Claims**



A mechanism for transferring containers between axially aligned reel and spiral cookers and coolers which mechanism includes a pair of turrets having container-holding pockets in their peripheries, each turret axis being mounted in a common plane at a 45° angle with the longitudinal axes of the cooker and cooler, the turrets being rotatable so that the pockets of one turret will confront the outlet of the cooker to receive a container and upon rotation will move the container into confronting relation with a pocket of the second turret, the pockets of said second turret being rotatable from a position confronting a pocket of said first turret into confronting relation with the inlet of the cooler so that a container may be transferred from the cooker to the cooler. The turret pockets may be constructed in the form of a rotary pressure valve.

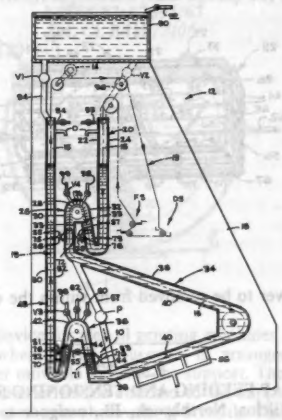
3,566,775

FLOW CONTROLLING SYSTEM FOR COOKERS

Samuel A. Mencacci, Wilrijk, Belgium, assignor to International Machinery Corporation, S.A., St. Niklaas-Waas, Belgium

Filed June 20, 1968, Ser. No. 738,448
Int. Cl. A23i *3/04*
U.S. Cl. 99—362 **13 Claims**

A protective system for maintaining the fluids in a hydrostatic cooker in static balanced condition. The protective system includes several series of baffles which upon flow of fluids therepast due to unbalanced conditions in the cooker cause measurable pressure drops. A control system is provided to detect the presence of pressure drops and open



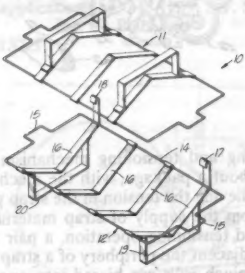
selected protective valves to rapidly direct the appropriate fluids into appropriate chambers thereby correcting the unbalanced conditions.

3,566,776

WIRE ROASTING FRAME

Virginia M. Young, and Garth L. Young, Jr., 327 S. Medio Drive, Los Angeles, Calif.

Filed Oct. 25, 1968, Ser. No. 770,498
Int. Cl. A47i *36/22*
U.S. Cl. 99—426 **3 Claims**



A pair of brackets are integrally secured about a roast to aid in handling. One of the brackets includes at least one hook integral with the bracket body for cooperating with parts on the other bracket to temporarily secure the brackets to one another about the roast, permitting the entire assembly to be handled as a unit.

3,566,777

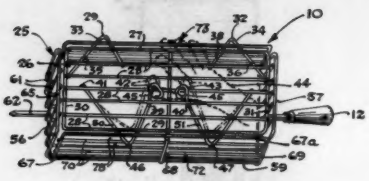
REMOVABLE CLOSURE MEMBER FOR BASKET

Walter Koziol, Russell, Ill., assignor to Charmglow Manufacturing Co., Antioch, Ill.

Continuation of application Ser. No. 672,780, Oct. 4, 1967, now abandoned. This application Dec. 4, 1969, Ser. No. 876,157
Int. Cl. A47j *43/18*
U.S. Cl. 99—427 **10 Claims**

A closure member for a wire type barbecue basket which is removably retained within the confines of the basket solely by means of stationary wire flanges at one side of the closure and movable wire type projections at the opposite side. The stationary flanges and the movable projections rest on the

horizontally extending wires of the basket and the movable projection is designed to be positioned inwardly to permit the



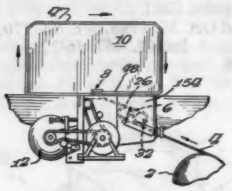
closure cover to be removed from within the confines of the basket.

3,566,778

STRAP FEEDING AND TENSIONING SYSTEM

Ilmar J. Vilcins, Northbrook, Ill., assignor to Signode Corporation

Filed Jan. 27, 1969, Ser. No. 793,967
Int. Cl. B65b *13/02*
U.S. Cl. 100—2 **9 Claims**



A strap feeding and tensioning mechanism for applying strap material about a package, with the mechanism including means for relieving the tension in the strap prior to severing the strap from the supply of strap material. During the strap feeding and tensioning operation, a pair of pinch rolls are positioned adjacent the periphery of a strap material feed wheel, and the pinch rolls are biased into engagement with the feed wheel and the strap material disposed thereabout. The strap tension is relieved by moving the pinch rolls to a position out of engagement with the feed wheel and the strap material.

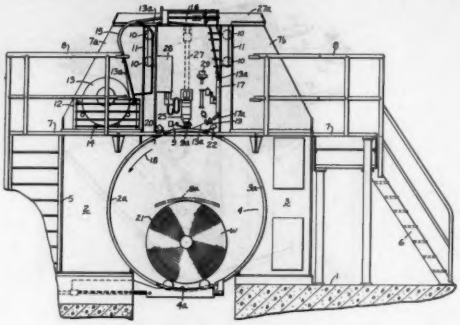
3,566,779

APPARATUS FOR BANDING WORKMEMBERS

Curt Kronsbein, Hagen-Boelerheide, Germany, assignor to Eugen Bellmann G.m.b.H., Hammerstrasse, Germany

Filed Oct. 21, 1968, Ser. No. 769,123
Claims priority, application Germany, Oct. 20, 1967, P 15 61 989.3
Int. Cl. B65b *13/04*
U.S. Cl. 100—4 **9 Claims**

The invention pertains to an apparatus for banding workmembers in the form of coils of strip material, or bunches, or stacks of sheet or rod material, and includes a frame into which the workmember is introduced horizontally, whereupon a strip of banding material is fed into the space around the workmember and guided about the member until its ends overlap. The leading end of the strip of banding material is then clamped to the workmember. The band is then drawn tight about the workmember and clamped thereto near the trailing end. The overlapping ends of the strip of banding



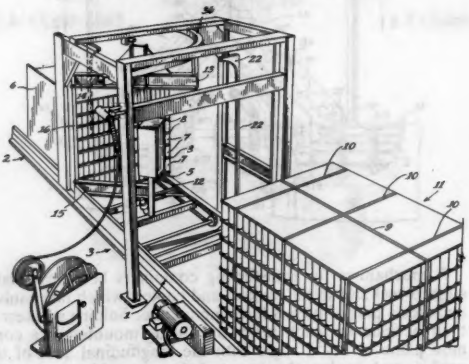
material is interconnected and the band is cut off from the supply of banding material.

3,566,780

STRAPPING APPARATUS

John C. Chisek; Robert H. Campbell, Chicago, and Earl H. Hahn, La Grange, Ill., assignors to said Earl H. Hahn and Robert H. Campbell assignors to Continental Can Company, Chicago, Ill. and said John C. Chisek assignor to Interlake Steel Corporation

Filed Jan. 14, 1969, Ser. No. 790,969
Int. Cl. B65b *13/04*
U.S. Cl. 100—7 **9 Claims**



Strapping apparatus for securing binder straps round a palletized load of cans or other objects having a conveyor along which a load is transported. The conveyor has a first station where the load is prepared and a longitudinal strap is applied and a second station where additional straps are applied transversely to the direction of the first strap. A gate provided with a strapping means is pivotable between the first station and the second station so that it can be employed for applying all of the straps to the load.

3,566,781

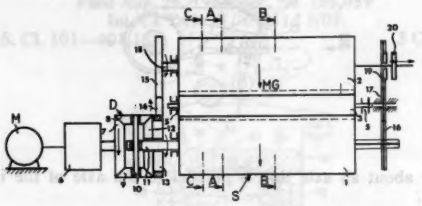
DEVICE FOR THE PRESSURE PROCESSING OF A CONTINUOUS PARTICULARLY TEXTILE WEB

Friedrich Kunze, Zittau, Germany, assignor to Veb Textilmaschinenbau Zittau, Zittau, Germany

Filed Aug. 12, 1968, Ser. No. 751,802
Int. Cl. B30b *3/04*
U.S. Cl. 100—172 **5 Claims**

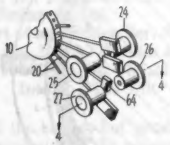
An apparatus for uniformly pressure treating a running web, such as an apparatus for squeezing a textile web, with

two outer rollers rotating in the same direction, and a central roller arranged between and slightly ahead of the outer rollers to define with one of them a working gap, in which the central roller, for purposes of closing the gap is movable



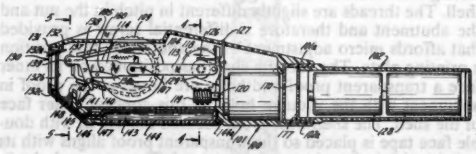
towards the gap, one of the outer rollers being driven by a differential transmission which includes a main drive member and an auxiliary drive member for this outer roller, while the outer roller drives the auxiliary drive member.

3,566,782
ADDRESS SYNCHRONIZER
Beat A. Kocher, Alameda, Calif., assignor to The Singer Company
Filed Aug. 21, 1968, Ser. No. 754,431
Int. Cl. B41j *1/34*
U.S. Cl. 101—93 **4 Claims**



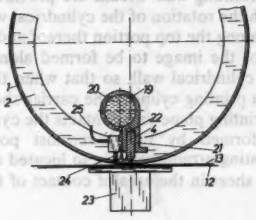
A synchronizer for the address counter of an on-the-fly print wheel has two photoelectric cells, one of which generates pulses in response to all character pads, or spaces, of the wheel, and the other in response to all spaces but one. The unpaired pulse is used for setting the address counter.

3,566,783
ELECTROMECHANICAL MARKING DEVICE
Howard Price, Kings Point, and Joseph Laszlo, New York, N.Y., assignors to International Patents & Development Corp.
Filed May 28, 1969, Ser. No. 828,573
Int. Cl. B41j *3/34, 7/84*
U.S. Cl. 101—108 **10 Claims**



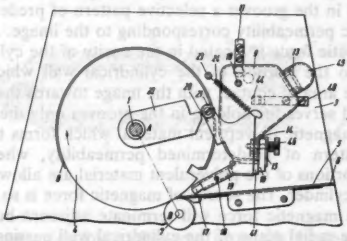
An electrically operated marking device for stamping articles repeatedly with preset characters. Marking of an article is accomplished by placing the marking device in contact with the article with slight pressure to close a switching contact. The closing of the switch causes the marking device to apply an impression of the preset characters to the article.

3,566,784
SQUEEGEE DEVICE
Mathias Mitter, Klagenfurt, Austria, assignor to Johannes Zimmer, Klagenfurt, Austria
Filed May 23, 1968, Ser. No. 731,549
Claims priority, application Austria, May 26, 1967, A4888/67;A7591/67
Int. Cl. B41l *13/06*
U.S. Cl. 101—120 **2 Claims**



A squeegee device for stencil printing machines having rotary screens wherein the squeegee is arranged on the squeegee carrier movable towards the support. The squeegee is under the action of forces directed to the support and essentially distributed over the working breadth. The squeegee on the one hand and one element of the support on the other are working elements acting on each other by magnetic forces wherein at least one of the elements is magnetic and the other at least partially of magnetizable material. An ink pipe projects inside a rotary screen and the squeegee carrier is connected with the ink pipe. A slit open towards the support is provided in the squeegee carrier and the squeegee is adjustable in the slit.

3,566,785
MOISTENING APPARATUS FOR DUPLICATING MACHINES
Gerhard Ritzerfeld, Berlin 33 (Dahelm), Germany
Continuation-in-part of application Ser. No. 719,142, Apr. 5, 1968. This application Jan. 31, 1969, Ser. No. 795,566
Int. Cl. B41l *7/08*
U.S. Cl. 101—132.5 **11 Claims**

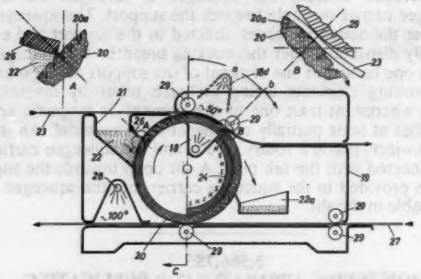


The moistening device of a duplicating machine has a soft highly absorbent felt pad which is in contact with a felt pad receiving liquid from a container, and also in contact with an applicator felt pad which moistens a copy sheet.

3,566,786
IMAGE PRODUCING APPARATUS
Helmut Kaufer, Am Duellanger Gruenwald near Munich; Erich Burger, Ter-Meer Str.17, Unterhaching near Munich, and Hans-Peter Huber, Saebenerstr. 100, Munich, Germany
Original application Jan. 29, 1965, Ser. No. 428,964, now Patent No. 3,472,695. Divided and this application Mar. 6, 1969, Ser. No. 804,956
Int. Cl. B41m *1/10*; B41f *9/00*
U.S. Cl. 101—150 **10 Claims**

A copy of an image is produced by utilizing the temperature dependency of the magnetic permeability of a mag-

netizable material in a device which comprises a cylindrical wall having a horizontal axis and formed with an inner cavity. Along the outer periphery of the cylindrical wall are formed a plurality of closely spaced grooves extending in longitudinal direction of the cylindrical wall. The cylindrical wall is rotatable about its axis and a feeding arrangement is provided for introducing magnetizable pulverulent material such as a magnetic ink into the grooves at a portion of the outer periphery of the cylindrical wall which is upstream of the top portion of the rotating wall. Means are provided for passing concurrent with the rotation of the cylindrical wall an image-carrying sheet along the top portion thereof and for passing a carrier sheet for the image to be formed along the bottom portion of the cylindrical wall, so that when the cylindrical wall serves as a printing cylinder the carrier sheet passes the cylinder in a printing plane and contacts the cylinder along a printing line formed by the lowermost portion of the cylinder. A heating arrangement is so located as to heat the image-carrying sheet in the area of contact of the same with



the outer surface of the cylindrical wall so that the magnetizable material in the grooves located in this area of contact will be selectively heated according to a pattern corresponding to the image, thereby forming in the magnetizable material in the grooves a selective pattern of predetermined magnetic permeability corresponding to the image. A source of magnetic force is located in the cavity of the cylinder adjacent to the portion of the cylindrical wall which passes from the area of contact with the image towards the printing line, and serves for holding in the grooves only the portions of the magnetic pulverulent material which forms the selective pattern of predetermined permeability, whereas the other portions of the pulverulent material are allowed to fall off the cylinder. The source of magnetic force is so arranged that the magnetic force will terminate adjacent but spaced from the radial plane of the cylindrical wall passing through the printing line, whereby at the printing line the pulverulent material forming the selective pattern will no longer be subjected to magnetic force and will drop from the grooves onto the carrier sheet forming thereon a copy of the image.

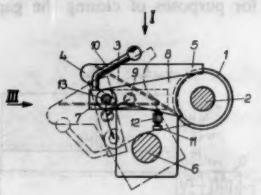
3,566,787

INK DUCT APPARATUS FOR PRINTING PRESSES

Franz Moos, Frankenthal, Pfalz, Germany, assignor to Schnellpressenfabrik Frankenthal, Albert & Cie, Aktiengesellschaft, Postfach, Germany

Filed Sept. 18, 1968, Ser. No. 760,606
Claims priority, application Germany, Sept. 18, 1967, 1,611,288
Int. Cl. B41f *31/06*
U.S. Cl. 101—363 **6 Claims**

This invention provides an ink duct apparatus for printing presses. The ink duct is mounted in the side frames of the printing press adjacent ink rollers which are also mounted therein. The sidewalls of the ink duct are in ink tight contact with the roller. Each ink duct is equipped with an ink knife. The ink duct may be swung away from and toward the ink



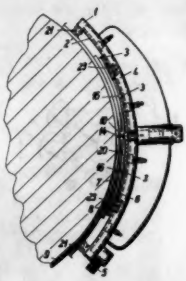
roller about an axle that is parallel to the axle of the ink roller.

3,566,788

APPARATUS FOR POSITIONING INDIVIDUAL PLATES IN EXACT REGISTER ON ROTARY LETTER PRESS PRINTING MACHINES

Hans-Bernhard Bolza-Schuenemann, Wurzburg, Germany, assignor to Schnellpressenfabrik Koenig & Bauer Aktiengesellschaft, Wurzburg, Germany

Filed July 24, 1968, Ser. No. 747,331
Claims priority, application Germany, Mar. 12, 1968, 42093
Int. Cl. B41f *27/06, 27/12, 13/16*
U.S. Cl. 101—426 **1 Claim**

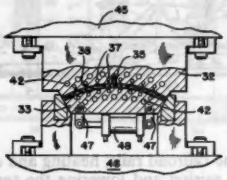


This is a handling device for placing and removing individual printing plates on letterpress rotaries in exact position on the printing or plate cylinder. There is an arcuate transparent shell of the size of the individual plate or a little greater. This shell has spaced apart passageways in the inner concave face that have connecting outlets in the face. The passageways are connected to pipe fittings that are in turn connectable to a vacuum source. At each side of the arcuate shell at points midway the ends of the shell, there is fixedly mounted a retractable spring biased punch which when released forces the punch outward from the inner face of the shell. Also mounted along one side and along one end of the shell are two spaced apart abutments that are slidably mounted in T-shaped grooves in the inner face of the shell. Each abutment is threadedly connected to a knurled end adjusting screw that is threadedly received in a nut fixed to the shell. The threads are slightly different in pitch in the nut and the abutment and therefore a differential screw is provided that affords micro adjustment of the abutments that position a printing plate. The vacuum shell has positioned on its inner face a transparent proof and holes are bored in the proof in alignment with the vacuum holes in this concave inner face of the shell. The shell with proof secured thereto as with double face tape is placed so the transparent proof aligns with its individual printing plate to be removed. The vacuum holes in the proof and shell abut the face of the printing plate. The vacuum is lightly applied at first so that the shell and proof while clinging to the printing plate may be moved into exact registry with the printing plate to be removed. The vacuum is fully applied and the spring pressed punches are released so that a keyhole is formed extending into the printing plate carrier shim mounted on the printing cylinder. This provides for exact remounting and registry of the same or other plates.

3,566,789
METHOD OF MANUFACTURING A COMPOSITE LETTERPRESS PLATE WITH SCARF DEFINING POCKETS

Robert F. Hecht, 115 Broadstreet Road, Centerville, Ohio, and Stanley Perdue, 345 Blatty Drive, Xenia, Ohio

Filed Aug. 26, 1968, Ser. No. 755,059
Int. Cl. B41c *1/18*; B41d *3/08*
U.S. Cl. 101—401.1 3 Claims



A novel printing plate is produced by placing an electrotype shell and a partial base in a mold cavity, holding them in place in properly spaced relation to each other as by means of vacuum and hydraulically or pneumatically operated hold down mechanisms, and filling the mold cavity with molten plastic or similar synthetic material from a plastic injection machine. The partial base skeleton includes scarf cavities, and portions of this skeleton may be embedded in the plastic when it hardens into the final shape.

3,566,790
PACKAGED AQUEOUS SLURRY TYPE EXPLOSIVES

Herbert G. Knight, Jr., Flanders, N.J., assignor to Hercules Incorporated, Wilmington, Del.

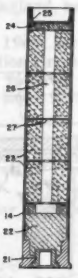
Continuation-in-part of application Ser. No. 694,097, Dec. 28, 1967, now Patent No. 3,442,729. This application Dec. 16, 1968, Ser. No. 784,211
Int. Cl. F42b *3/00*
U.S. Cl. 102—24 18 Claims

A packaged, and thickened, but generally pourable, inorganic oxidizer salt explosive of the aqueous slurry type is provided which contains a "release" agent to preclude adhesion of the mass of explosive to the inner wall of the container during gravitation of the mass therefrom. The agent is disposed so as to be in direct contact with said mass and the container inner wall across the mass-inner wall interface during the gravitation. In certain embodiments the agent serves as a fuel for the subsequent detonation.

3,566,791
SIGNAL CARTRIDGE FOR PROVIDING LONG DURATION DISPLAY

Carl W. Lohkamp, Scotland, Ind., assignor to the United States of America as represented by the Secretary of the Navy

Filed Mar. 20, 1969, Ser. No. 808,734
Int. Cl. C06d *1/10*
U.S. Cl. 102—32 3 Claims



A signal cartridge for providing a night display of relatively long duration having a plurality of flare pellets within a cartridge case and having means for expelling and igniting the flare pellets to produce a shower display of burning chaff which has been mixed into the flare pellets.

3,566,792
AMMUNITION

Andrew J. Grandy, 2707 Grant Ave, North Hills, Pa.

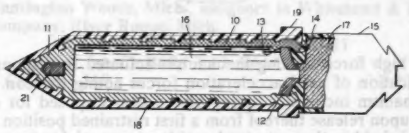
Filed June 26, 1968, Ser. No. 740,141
Int. Cl. F42b *5/26*
U.S. Cl. 102—38 3 Claims

A built-up cartridge case in which a blanked and formed steel metal skeleton is provided having longitudinal finger elements that are laminated with reinforced plastic material.

3,566,793
ARMOR PIERCING ROCKET

George R. Kruzell, 4301 Hotchkiss, Bay City, Mich.

Filed Sept. 27, 1968, Ser. No. 763,321
Int. Cl. F42b *13/06*, *13/28*
U.S. Cl. 102—49.3 1 Claim



An armor piercing rocket-type projectile having a drill-type penetrator embedded within the forward nose portion thereof so that upon impact the penetrator is driven forward from the projectile, into the target and displaces material as it moves therethrough.

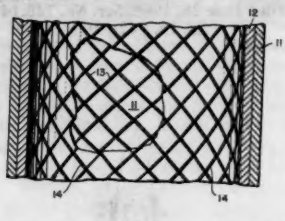
3,566,794
CONTROLLED FRAGMENTATION OF MULTI-WALLED WARHEADS

John Pearson; Robert G. S. Sewell, and Richard T. Carlisle, China Lake, Calif., assignors to United States of America as represented by the Secretary of the Navy

Filed Nov. 26, 1958, Ser. No. 776,656
Int. Cl. F42b *13/18*
U.S. Cl. 102—67 3 Claims

A fragmentation device comprising; an inner fragmentation casing comprising a right circular cylindrical tube of fracturable material of uniform wall thickness adapted to be impulsively loaded internally thereof, said wall having intersecting sets of equally spaced helical stress-forming grooves therein disposed circumferentially about the inner surface thereof and extending in the longitudinal direction of the

tube, the spacing and depths of said grooves with respect to the thickness of said wall being such that upon a predetermined amount of internal impulse loading, cleavage surfaces due to shear propagation and emanating at a groove, are formed in two outward directions at 45° away from a diametrical plane containing the axis of the tube and a groove and each cleavage surface intersects, at the outer surface of the



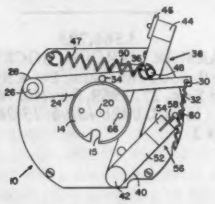
tube, with a like cleavage surface emanating from an adjacent groove and an outer like fragmentation casing surrounding said inner casing with its inner surface engaging the outer surface of the inner casing, whereby impulsive loading within the inner casing transmits forces to the outer casing prior to fragmentation of the latter and both casings fragment simultaneously.

3,566,795

ACCELERATION-ACTUATED STRIKING MECHANISM

Bernie J. Cobb, and Frank R. Skinner, Huntsville, Ala., assignors to the United States of America as represented by the Secretary of the ARMY

Filed May 23, 1968, Ser. No. 731,518
Int. Cl. F42c *9/02, 9/04*
U.S. Cl. 102—83 **5 Claims**



A high force striking mechanism actuated in response to application of axial acceleration forces acting thereon. The mechanism includes a spring-biased cam disposed for rotation upon release thereof from a first restrained position. The cam is held in the restrained position by a weighted member having a spring secured thereto and extending therefrom in interfering engagement with the cam. Acceleration forces acting on the weighted member causes displacement thereof for release of the spring-biased cam from its restrained position for rotation of the cam. A first spring-biased arm supports a spring-biased striker arm in cocked position against a cam surface provided on the first arm. A cam follower carried on the first arm is disposed for movement along the periphery of the cam until it falls into a cam slot thereon to cause displacement of the first arm. The spring-biased striker arm is released as a result of the displacement of the first arm to cause the striker to impact on a percussion squib or other mechanisms with high force.

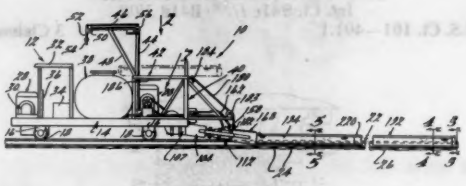
3,566,796

RAIL TEMPERATURE REGULATING APPARATUS

Clifford C. Herrick, White Plains, N.Y., assignor to Penn Central Company.

Original application Mar. 28, 1967, Ser. No. 631,112, now Patent No. 3,451,470, dated Feb. 24, 1969. Divided and this application Mar. 28, 1969, Ser. No. 840,864
Int. Cl. B60h *3/04;* **E01b** *29/32*
U.S. Cl. 104—2 **12 Claims**

An apparatus for controlling the temperature of a section of railroad rail in order to expand or contract the section preparatory to anchoring the same to its associated roadbed; the apparatus comprising a self-propelled wheeled vehicle which is adapted to travel along a railroad right-of-way and is provided with a pair of elongated temperature regulating enclosures which extend rearwardly from the vehicle and par-



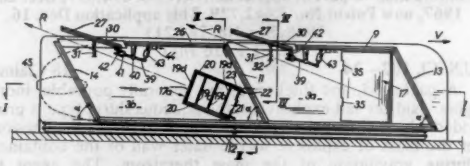
tially enclose the railroad rails; heating and cooling means on the vehicle for raising and lowering the temperature within the enclosures to heat or cool the rail sections enclosed therewithin; and means for moving the enclosures between an inactive position on the vehicle to an operative position extending rearwardly of the vehicle.

3,566,797

JET THRUST PROPULSION OR BRAKING DEVICE FOR A GROUND EFFECT MACHINE

Francois Louis Giraud, Plaisir, France, assignor to Societe De L'"Aerotrain", Paris, France

Filed Oct. 17, 1968, Ser. No. 768,286
Claims priority, application France, Oct. 19, 1967, 125.114
Int. Cl. B60v *1/04, 1/14, 1/18*
U.S. Cl. 104—23 **7 Claims**



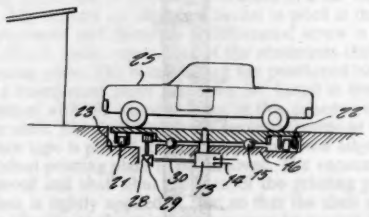
A propulsion or braking device for a fluid cushion machine comprising means for supplying pressurized fluid to the cushion and exhausting fluid therefrom with a velocity component directed along the longitudinal axis of the machine.

3,566,798

AUTOMOBILE TURNTABLE

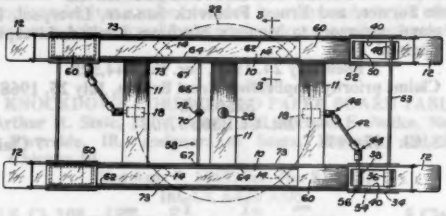
Herbert G. Peitzman, Des Moines, Iowa (P. O. Box 12, Johnston, Iowa 50131)

Filed Feb. 10, 1969, Ser. No. 797,750
Int. Cl. B60s *13/02*
U.S. Cl. 104—44 **1 Claim**



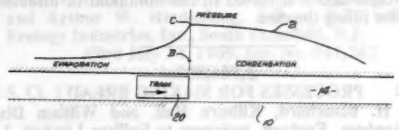
A turntable for an automobile driveway of limited width so as to permit a vehicle to run around for forward travel along the driveway, the turntable including a mechanism for rotating the same.

3,566,799
MOTOR VEHICLE TURNTABLE ASSEMBLY
James J. Stern, 115 Short Hills Road, West Orange, N.J.
Filed May 5, 1969, Ser. No. 821,710
Int. Cl. B60s *13/02*
U.S. Cl. 104—44 10 Claims



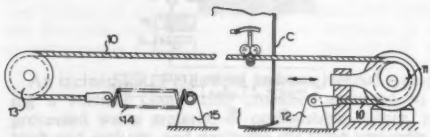
A motor vehicle turntable assembly for a garage or driveway or the like is provided for turning a motor vehicle around in a limited space. The turntable is mounted on support rollers which directly contact the driveway surface and are directly driven by the vehicle rear wheels via drivable wheel means mounted on the turntable and engaged by the vehicle rear wheels when the rear wheels are driven in reverse. Drivable roller means are disposed at each end of the turntable and a slide assembly is provided for covering the drivable roller means closest to the vehicle as it is driven onto the turntable and for uncovering the said closest drivable wheel means after the vehicle front wheels have moved over them.

3,566,800
TRANSPORTATION SYSTEM
Raymond L. Chuan, Altadena, and Norman V. Petersen, Chatsworth, Calif., assignors to The Susquehanna Corporation, Fairfax, Va.
Filed Nov. 28, 1967, Ser. No. 686,105
Int. Cl. B61b *13/10*
U.S. Cl. 104—138 10 Claims



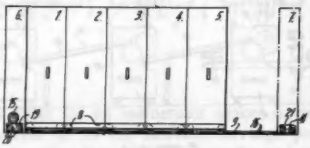
A novel transportation system is described including a payload carrying vehicle, and a close fitting tube through which the vehicle travels. Aerodynamic drag on the vehicle is substantially eliminated by effecting, thermodynamically, a phase change in the tube medium in advance of the vehicle which is reversible to the rear of the vehicle.

3,566,801
TRANSPORT MEANS
Joseph Ashurst, Wigan, England, assignor to Gullick Limited, Wigan, England
Filed Jan. 27, 1969, Ser. No. 794,266
Claims priority, application Great Britain, Feb. 28, 1968, 9608/68
Int. Cl. B61b *9/00, 7/20*
U.S. Cl. 104—173 14 Claims



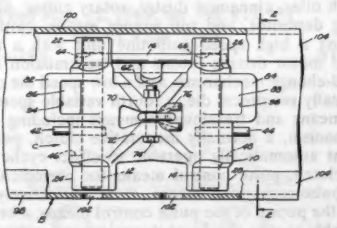
A transport means comprises a carriage and an elongated member, for example, a flexible cable, anchored at and extending between the ends of a path to be travelled by said carriage. Means is provided for oscillating said elongated member in the direction of its length and the carriage is connected to the elongated member by a unidirectional driving device whereby the vehicle is caused to travel in one direction along the length of the elongated member when the latter is oscillated. Two oppositely acting unidirectional driving devices may be provided for connecting the carriage to the elongated member, one or other of these unidirectional driving devices being selected according to the direction along the elongated member in which it is desired that the carriage should travel.

3,566,802
ELECTRICALLY CONTROLLED TRACTION DEVICE FOR MOVABLE UNITS, ESPECIALLY CONTAINERS OR SHELVING UNITS
Harald O. Lundgvist, 25, route deMalagnou, Geneva, Switzerland
Filed Sept. 9, 1968, Ser. No. 758,456
Claims priority, application Switzerland, Sept. 12, 1967, 012814/67
Int. Cl. A47b *53/02;* B61b *13/12*
U.S. Cl. 104—172 19 Claims



A device for moving several shelving units to open a gangway between any of them. The units are mounted on rails over a chain and have a solenoid to operate a plunger to engage the chain. A motor is variably coupled to the chain depending on the number of units to be moved and switches mounted along side of the rails control the movement of the units over specific lengths.

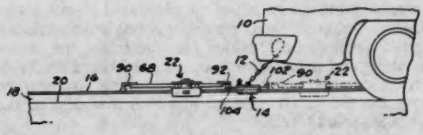
3,566,803
VEHICLE TIE-DOWN STRUCTURE
Donald J. Blunden, Southfield, and Israel D. Peisner, Huntington Woods, Mich., assignors to Whitehead & Kales Company, River Rouge, Mich.
Filed July 5, 1968, Ser. No. 742,681
Int. Cl. B60p *7/10;* B61d *45/00*
U.S. Cl. 105—369 9 Claims



This invention relates to a tie-down system for vehicles.

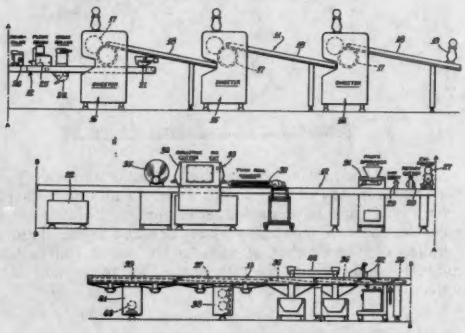
3,566,804
JACK FOR ADJUSTING CARGO HOLDDOWN APPARATUS
Walter F. Mietla, Dearborn, Mich., assignor to Portec Inc., Chicago, Ill.
Filed Dec. 6, 1968, Ser. No. 781,821
Int. Cl. B61d *45/00;* B60p *7/08;* B65i *1/22*
U.S. Cl. 105—369 12 Claims

A rack and pinion type jack having a push-pull implement and bidirectional ratchet for moving cargo tiedown devices



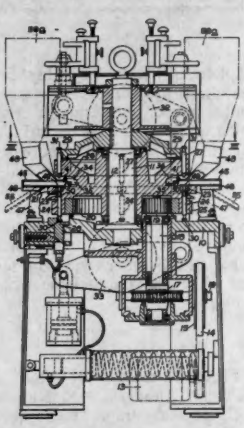
chains. The jack has a multipurpose framework rendering it compatible with T-beam anchoring rails and also channel type anchoring rails.

3,566,805
PASTRY PRODUCT PRODUCTION SYSTEM
Alfred L. Meyer, Wood Dale, Ill., assignor to Anelsberger Brothers Inc., Northbrook, Ill.
Filed Sept. 9, 1968, Ser. No. 758,246
Int. Cl. A21c *11/10*
U.S. Cl. 107—1 **15 Claims**



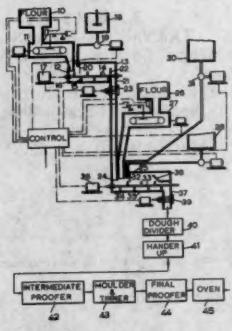
A pastry product production system for programmed sheeting, forming, cutting and finishing operations, comprising sheeting means for receiving pastry dough and rolling it into a continuous sheet and including variable speed motor driving means and transmission means having speed-change mechanism; makeup conveyor means for receiving the dough sheet and including a second variable speed motor driving means and selectively operable cross roller, flour brush, dough oiler, cinnamon duster, rotary cutter, paste spreader, filling depositor, and roll winder means; cutting means including a high speed guillotine unit with a third variable speed motor driving means and transmission means having speed-change mechanism, and a low speed die cut unit with a vertically reciprocal die, a fourth variable speed motor driving means and transmission means including speed-change mechanism, a normally inoperative clutch, pulse-responsive means automatically operable to effect cyclic operation of the clutch, pulse control means for periodically energizing the pulse-responsive means, means selectively operable to vary the period of the pulse control means, a brake cyclically operable to stop the die at its uppermost position, a die guide reciprocable horizontally to move the die at the bottom of its stroke with the dough being cut, selectively adjustable means for varying such horizontal throw of the die guide, and a protective hood with a safety switch for stopping operation of the system when the hood is opened: finishing means including conveyors and a fifth variable speed motor driving means; and a control unit including a variable speed generator for supplying alternating current to all of the motor driving means and selectably varying the frequency thereof to synchronize the several variable speed motor driving means, and means for individually adjustably controlling operation of the sheeting, makeup, cutting and finishing means to selectively program the production of different types of products, including means for indicating and controlling the speed of the generator, means for indicating the output speed of each transmission means, and selectively operable controls for each speed-change mechanism.

3,566,806
ROTARY TABLETTING MACHINES
Eric Forster, and Ernest Frederick Sumner, Liverpool, England, assignors to Manesty Machines Limited, Liverpool, England
Filed July 24, 1969, Ser. No. 844,525
Claims priority, application Great Britain, July 25, 1968, 35505/68
Int. Cl. B30b *11/02*
U.S. Cl. 107—17 **7 Claims**



In a rotary tabletting machine, the annular space occurring between the die table and the usual flange thereabove is enclosed as a material feed chamber for containing material to be tabletted, so that such material moves continuously with the die table and is involved in the minimum of directional change for filling the dies.

3,566,807
PROCESSES FOR MAKING BREAD
George H. Blanchard, Kilburn Hall, and William Dixon, Twickenham, England, assignors to Spillers Limited, London and Wallace & Tiernan Limited, Tonbridge, England
Filed Oct. 3, 1968, Ser. No. 764,775
Claims priority, application Great Britain, Oct. 6, 1967, 45710/67
Int. Cl. A21d *2/22*
U.S. Cl. 107—54 **17 Claims**



There is disclosed a process for the continuous production of dough from normal bleached and treated flour, in which a

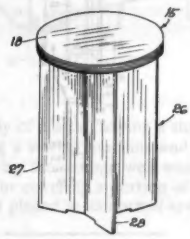
stream of about three-quarters of the flour and a stream of a suspension of yeast in water are mixed under controlled conditions in a first mixing stage to form a batter which is fed to a second mixing stage in which the remainder of the flour, any remainder of the water are added and mixed under controlled conditions to form dough, which is delivered as a continuous flow of dough to a divider. Fat and/or improvers and/or additives can be included in either or both the mixing stages and the normal fermentation period can be eliminated.

3,566,808

KNOCKDOWN CORRUGATED PAPER BOARD TABLE

Arthur R. Slate, Jr., Chicago, and Michael F. Notko, North Riverside, Ill., assignors to Sears, Roebuck and Co., Chicago, Ill.

Filed Apr. 7, 1969, Ser. No. 814,035
Int. Cl. A47b 3/06
U.S. Cl. 108—157 8 Claims



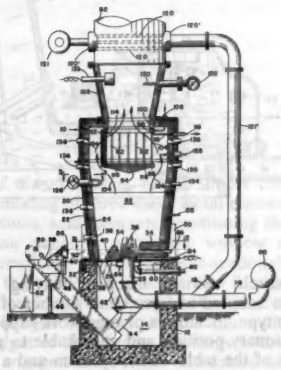
A knockdown table formed from die-cut and scored panels of corrugated paper board adapted to be shipped in flat condition and to be erected at the point of use into a table which has substantial stability and strength.

3,566,809

INCINERATOR FOR WASTE MATERIAL

Robert W. Carry, Oradell; Francis J. Flemming, Plainfield, and Arthur W. Hindenlang, Edison, N.J., assignors to Ecology Industries, Inc., South Plainfield, N.J.

Filed July 14, 1969, Ser. No. 841,262
Int. Cl. F23g 5/12
U.S. Cl. 110—8 11 Claims



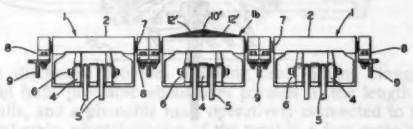
An incinerator of industrial and commercial type comprising a vertical combustion chamber arranged to receive processed waste material of combustible nature, including trash and garbage, and discharge the same upwardly through the bottom of the chamber for initial combustion by a primary burner surrounding the inlet to the chamber, the exhaust for products of combustion being positioned adjacent the top of the chamber and a horizontal separator being positioned in spaced relationship to the inlet to the exhaust means operable to cool the gases of combustion and also deflect solid material back to the combustion zone, and ash discharge means located in the bottom of the combustion chamber for discharge into a quenching pool having conveyor means to remove the quenched ash upwardly for discharge to suitable disposal means.

3,566,810

INCINERATOR STOKER WINGED GRATE

Donald J. Sprague, Massillon; Joseph F. Stenglein, Centerville, and Glenn T. Dubs, Canton, Ohio, assignors to Canton Stoker Corporation, Canton, Ohio

Filed Aug. 12, 1969, Ser. No. 849,349
Int. Cl. F23b 1/22
U.S. Cl. 110—39 6 Claims



A pivoted grate for an incinerator stoker having a high point at the rear of its top surface, the high point being located at the median line of the incinerator stoker. The top surface of the grate is sloped down forwardly and laterally from said high point.

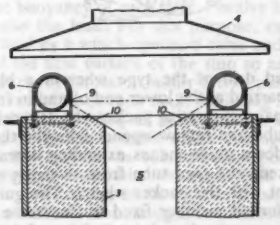
With an even number of pivoted grates in each row, the two pivoted grates in the center of each row are winged grates, each having the high point at the inner rear corner of the top. Where an uneven number of pivoted grates is located in each row, only the center grate of each row is a winged grate, the high point being at the center of the rear edge of the top.

3,566,811

AIR DAMPER

David J. Tidd, Scott Township, Pa., and Lawrence E. Carroll, Oswego, N.Y., assignors to said Carroll assignor to Alcan Research and Development Ltd., Montreal, Canada and said Tidd assignor to Loftus Engineering Corporation, Pittsburgh, Pa.

Filed Mar. 12, 1969, Ser. No. 812,951
Int. Cl. F23j 11/00
U.S. Cl. 110—184 3 Claims



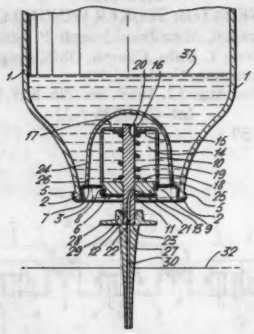
There is disclosed a damper for use in furnace flues wherein opposed sheets or curtains of air are directed from ducts on opposite sides of a flue toward the center at a downward slope, and regulation thereof by controlling the damper by varying the air flow to the ducts.

3,566,812

DISPENSING APPARATUS

Edward Barnes, Speldhurst, and Kenneth Horace Nance, Bromley,Kent, England, assignors to Direct Nitrogen Limited, London, England

Filed June 10, 1968, Ser. No. 735,664
Claims priority, application Great Britain, June 28, 1967, 29718/67
Int. Cl. A01c 23/02
U.S. Cl. 111—7.3 7 Claims



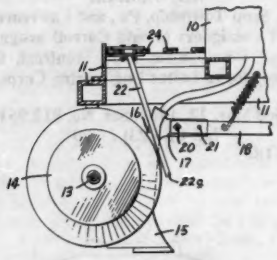
A pressure pack for dispensing anhydrous nitrogenous fertilizers containing anhydrous liquid ammonia and a normally solid compound soluble therein for example ammonium nitrate. The pack is safe to use and since the fertilizer is self dispensing no propellant is required. The pack is particularly useful for domestic garden use.

3,566,813

SEED BOOT RESTRICTOR FOR SEED DRILLS

Archie D. Staley, Rte 1, and Ernest G. Stoess, P.O. Box 656, Washtucna, Wash.

Filed Sept. 12, 1968, Ser. No. 759,439
Int. Cl. A01c 5/06
U.S. Cl. 111—85 5 Claims



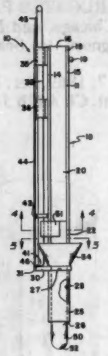
In a seed drill of the type wherein a bladelike furrow opener is carried at the lower end of and in front of the seed tube, and pairs of rotating packer wheels receive a portion of the seed tube and furrow opener between them, this invention provides a guide means extending downward from the frame to keep the seed tube from swinging or twisting into engagement with the packer wheels. The guide means consists of a forked member fixed to the frame and having its lower portions extending down in front of the packer wheels along the sides of the seed tube and across the tube inhibiting transverse movement of the tube to such extent as to bring the tube into contact with the packer wheels. The seed tube is free to move up and down between the portions of the guide for adjustment of depth of planting of the seed and for transport and is protected against wear by engagement with the rotating packer wheels in all of its positions.

3,566,814

PLANTING TOOL FOR TREE SEEDLINGS

Norman R. Pelton, 12127 York Ave., Haney, British Columbia, Canada

Filed Feb. 24, 1969, Ser. No. 801,273
Claims priority, application Canada, Feb. 6, 1968, 013,329
Int. Cl. A01c 5/02; A01b 45/02
U.S. Cl. 111—99 8 Claims



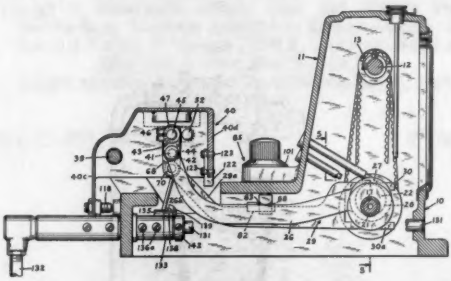
A tool having a punch for forming a hole in the ground and a guide for directing a tree seedling into the hole.

3,566,815

SKIP STITCH MECHANISM FOR BLIND STITCH SEWING MACHINE

William T. Richards, Chicago, Ill., assignor to Union Special Machine Company, Chicago, Ill.

Filed Sept. 23, 1969, Ser. No. 860,217
Int. Cl. D05b 1/24
U.S. Cl. 112—178 9 Claims

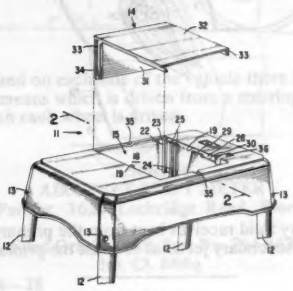


Blind stitch sewing machine having an improved mechanism adapted to form blind stitches of either the skip or nonskip type. Includes a pivoted work support table lockable to stationary position and unlockable to permit swinging movement of the table. A first pitman and a second pitman operate in response to rotation of the main shaft of the machine. The forward end of the first pitman is connected to a rockable node former shaft which rocks in a rockable cradle under the work support table. The forward end of the second pitman is connected to the cradle. Means are provided for adjusting the machine to nonskip position in which the second pitman idles and to skip position in which the second pitman is fulcrumed so that it causes the cradle to be rocked.

3,566,816
SEWING TABLE

George L. Zilg, Dunellen, and Henry J. Milan, Clark, N.J., assignors to The Singer Company, New York, N.Y.

Filed May 7, 1969, Ser. No. 822,457
Int. Cl. D05b 75/00, 77/00
U.S. Cl. 112—217.1 10 Claims

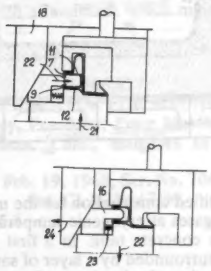


A table, preferably of plastic, having a storage well formed therein for receiving a sewing machine and including a table top insert for covering the storage well when the machine is stored therein and for covering a portion of the opening only when the machine is placed in its normal sewing position.

3,566,817
METHODS OF MANUFACTURING VEHICLE DOORS

Gaetan De Coye De Castelet, Billancourt, France, assignor to Regie Nationale Des Usines Renault, Billancourt, France and Automobiles Peugeot, Paris, France

Filed Feb. 5, 1968, Ser. No. 703,127
Claims priority, application France, Mar. 8, 1967, 97,915
Int. Cl. B21d 51/00
U.S. Cl. 29—525 3 Claims



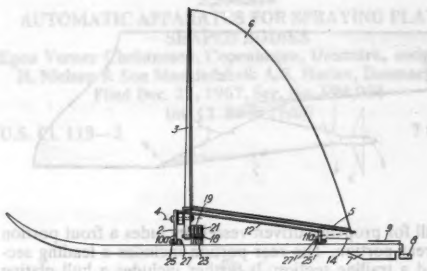
A method of manufacturing vehicle doors comprising a window and consisting of three sheet metal elements pressed or made of sections, said elements constituting the first one an external door panel in which the window opening is formed, the second one an internal box-sectional door element in which the window opening is also formed, and the third one a window frame consisting of channel sections, having their side flanges directed towards the middle of the opening. The edges of the window openings folded inwardly of the door are engaged in the frame and folded each against the internal face of the corresponding flange of the channel section, respectively, the peripheral edge of the external panel and box-sectioned element being subsequently folded on each other.

3,566,818
WITHDRAWN

3,566,819
SAILING CRAFT

James Edward Keddie, 1 Freelands Road, Bromley, Kent, England

Filed Apr. 28, 1969, Ser. No. 819,645
Claims priority, application Great Britain, Apr. 26, 1968, 19928/68
Int. Cl. B63b 35/00; B63h 9/04
U.S. Cl. 114—39 6 Claims

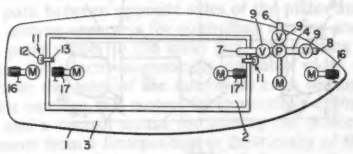


The disclosure provides a sailing craft having elongate parallel hulls pivotable about axes parallel to the length of the hulls, and a pivotable mast operatively connected to the hulls whereby pivotal motion of the mast in a first sense will result in pivotal motion of the two hulls in the reverse sense of rotation. The craft may be used either on water or as a snow yacht.

3,566,820
MARINE SALVAGE APPARATUS

John J. Bayles, Oxnard, Calif., assignor to the United States of America as represented by the Secretary of the Navy

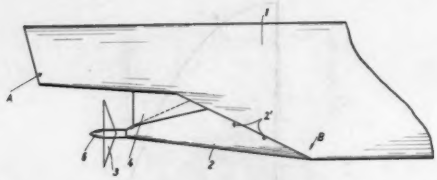
Filed Aug. 8, 1969, Ser. No. 848,432
Int. Cl. B63c 7/00
U.S. Cl. 114—50 6 Claims



A ship hull is divided into a pair of tanks, the first being centrally disposed of the hull and the second disposed peripherally of the first. The tanks are movable upwardly and downwardly independently one of the other in response to variations in the buoyancy of each tank. Positive buoyancy is employed to raise the load. For this purpose, each tank is secured to the load by a winch-operated cable and each tank forms a part of the skin surface of the ship so as to be exposed to the buoyancy forces. A motor-driven pump permits the filling and evacuating of each tank, the lifting force being achieved by initially tightening all of the cables, submerging one of the tanks to slacken its cable which then again may be tightened with this tank in its submerged disposition. Sea water then is pumped from this submerged tank to create a positive buoyancy which, due to the tightened cable, lifts the load. Next the other tank is submerged to produce a slack in its cable while the cable of the previously-submerged tank remains taut. Slack is again taken up and the submerged tank pumped to provide another incremental lifting force. Successive incremental lifting forces raise the object to the surface.

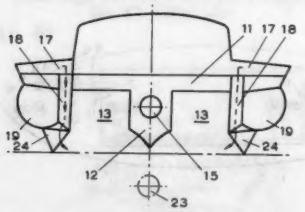
The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

3,566,821
HULL FOR PROPELLER-DRIVEN VESSELS
Herbert Schneekluth, Aachen, Germany, assignor to Blohm & Voss A G, Hamburg, Germany
Filed Aug. 9, 1968, Ser. No. 751,483
Claims priority, application Germany, Aug. 11, 1967, 1,531,561
Int. Cl. B63b 1/04
U.S. Cl. 114—57 6 Claims



A hull for propeller-driven vessels includes a front portion and a rear portion. The rear portion includes a leading section and a trailing section. It further includes a hull plating having at opposite sides of the rear portion mutually inclined outer guide surface means constructed and arranged to effect in the region of the leading section a rearward and upward deflection of fluid streaming along the hull towards the rear portion. An elongated rearwardly tapering bulge extends rearwardly from the region of the leading section of the rear portion.

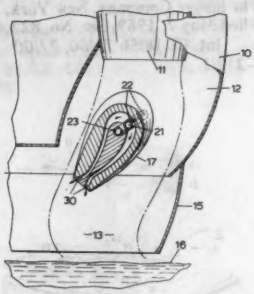
3,566,822
AIR CUSHION VEHICLES
Peter Rowland Crewe, Newport, England, assignor to British Hovercraft Corporation Limited, Yeovil, England
Filed Jan. 27, 1969, Ser. No. 794,225
Claims priority, application Great Britain, Feb. 16, 1968, 7677/68
Int. Cl. B63b 1/38
U.S. Cl. 114—67 5 Claims



A vehicle for operating over water supported by air cushions and having a central hull to divide the air cushion area and to provide a low location for a prime mover and power transmission system. The hull provides additional buoyancy and is shaped to provide planing lift. The air cushion area is bounded partly by rigid members and partly by a flexible skirt assembly. The rigid members include ducts to conduct pressurized air to the air cushion and have on their outer sides inflated flexible members which give additional buoyancy and protection against wave impact caused by high seas.

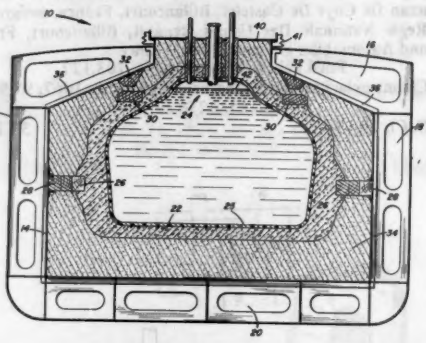
3,566,823
POWER PLANT
Charles Davis Hope-Gill, 1580 Jamaica Square, North Tonawanda, N.Y.
Filed Oct. 28, 1968, Ser. No. 771,119
Claims priority, application Great Britain, Nov. 7, 1967, 50526/67
Int. Cl. B63b 1/38
U.S. Cl. 114—67 14 Claims

In a jet power plant, the mass flow and/or momentum of the primary jet is augmented by passing the hot primary jet over a heat exchanger to which a secondary fluid is supplied.



The secondary fluid receives heat from the primary jet and is directed as a secondary jet so as to assist the primary jet.

3,566,824
MARINE TRANSPORTATION OF LIQUIFIED GASES
Joseph J. Cuneo, Scarsdale; Norman K. Basile, Hauppauge, L.I.; George R. Knight, and Thomas F. Bridges, Port Washington, N.Y., assignors to John J. McMullen Associates, Inc., New York, N.Y.
Filed Apr. 3, 1969, Ser. No. 813,087
Int. Cl. B63b 25/08; B65d 25/18
U.S. Cl. 114—74 12 Claims

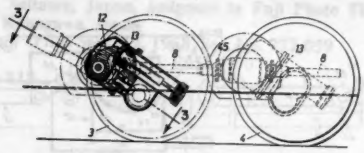


A ship of simplified construction for the marine transportation of liquefied gases at cryogenic temperatures is equipped with at least one concrete tank. In a first embodiment, the concrete tank is surrounded by a layer of sand. A second embodiment contemplates both a layer of sand surrounding the concrete tank and a further layer of insulating material within the tank. In a third embodiment, a layer of insulating material is provided within the concrete tank. A fourth embodiment of the invention relates to a concrete tank surrounded by a layer of insulating material which abuts the hull of the ship. And in a fifth embodiment of the invention, the entire hull of the ship is concrete and forms at least one containment tank. In the fifth embodiment, there may be provided a layer of insulating material within each tank.

3,566,825
AMPHIBIOUS ARMORED VEHICLE
Walter Ruf, Battighofen, Landhaus am See Thurgau, Switzerland
Filed Sept. 3, 1968, Ser. No. 756,947
Int. Cl. B63f 3/00
U.S. Cl. 115—1 8 Claims

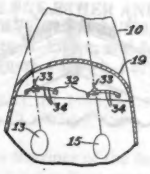
An amphibious armored vehicle having a plurality of wheels which are arranged in spaced relationship on each side of a hull and which is steered by controlling the speed of

the wheels on one side as compared with the speed of the wheels on the other side. Each wheel is individually



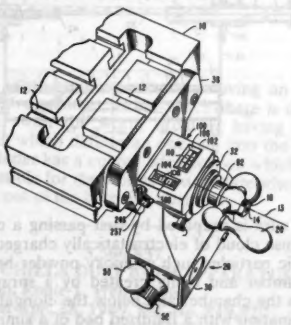
suspended and on each side of the vehicle there is provided a drive shaft means which is driven from a steering mechanism and by which each wheel is driven.

3,566,826
AIRCRAFT DRIFT METER
Lloyd M. Forster, 1624 Lochridge Road, Bloomfield Hills, Mich.
Filed Oct. 3, 1968, Ser. No. 764,843
Int. Cl. B60q
U.S. Cl. 116—28 **1 Claim**



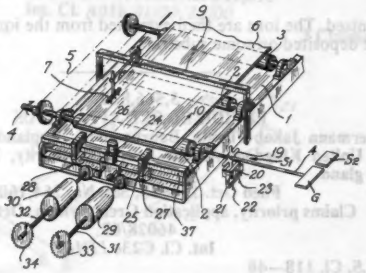
An aircraft drift meter comprising a centerline mark on the cowling parallel to the longitudinal axis of the aircraft and in line with the center of the pilot's seat. A plurality of incrementally angular lines marked on the cowling on either side of the centerline radiating from a center point coinciding approximately with the pilot's eye position in order to facilitate pilot observation while in flight with visual land contact of the actual track of the aircraft by alignment of a radial line on the cowling with a landmark which maintains such alignment.

3,566,827
POSITION INDICATOR FOR MACHINE TOOLS
Francis L. Moseley, Pasadena; Peter Moseley, and Glenn A. Johnson, Altadena, Calif., assignors to Servo Products Company
Filed Feb. 19, 1968, Ser. No. 706,586
Int. Cl. B23g *17/00*
U.S. Cl. 116—115.5 **9 Claims**



A reversible bidirectionally operable position indicator, driven by a lead screw, for example, is provided for showing the accumulated displacement of a workpiece to either side of a reference point. A coarse reading of displacement is furnished by a resettable counter driven in a selected direction by a transmission coupled to the lead screw and having a bidirectional output. A fine reading of displacement is provided by a manually adjustable vernier scale cooperating with a reference scale driven by the lead screw. A gearing arrangement may be utilized for obtaining indicator readings, selectively, in either the English or metric system.

3,566,828
AUTOMATIC APPARATUS FOR SPRAYING PLATE-SHAPED BODIES
Egon Verner Christensen, Copenhagen, Denmark, assignor to H. Nielsen & Son Maskinfabrik A/S, Herlev, Denmark
Filed Dec. 27, 1967, Ser. No. 694,001
Int. Cl. B05c *11/00*
U.S. Cl. 118—2 **7 Claims**

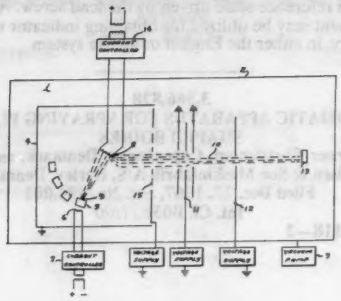


Automatic apparatus for spraying plates including a roller conveyor for conveying plates along a path, at least one spray gun for spraying the plates during movement, driving mechanism for reciprocating the spray gun across the conveyor path between opposite sides of the plates and an electronic sensing apparatus for controlling starting and stopping of the paint supply to the spray gun. The sensing apparatus includes two electromagnetically operable width measuring sensors at the inlet of the conveyor, each sensor having a movable carriage, two motors for respectfully driving the carriage, and a control means for starting the motors to move the sensors from a first position in the vicinity of the longitudinal centerline of the conveyor path in opposite directions across said path towards the opposite edges of the plate to outer positions corresponding to the opposite side edges of the plate. Additionally included is an electric bridge circuit including a potentiometer having a displaceable tap whose axis is mechanically coupled to the motors of the carriages; said tapping arranged such that in the outer position of a sensor carriage, the tap determines the position of one side edge of the plate in relation to the longitudinal axis of the conveyor path.

3,566,829
ION IMPLANTATION MEANS INCLUDING A VARIABLE RATIO ION SOURCE
Bryan H. Hill, Dayton, Ohio
Filed Mar. 6, 1969, Ser. No. 804,886
Int. Cl. C23c *13/08*
U.S. Cl. 118—5 **1 Claim**

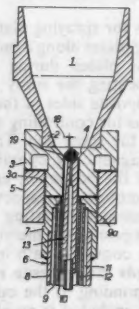
An ion source capable of producing an ion beam comprised of a plurality of controlled ion species. A plurality of effusion cells, each containing a particular evaporant, are positioned at equal distances from a hot ionizing surface. The number of molecules effusing from the respective effusion cells are controlled, thereby controlling the ratio of the molecules effusing from a particular cell with respect to the sum total of the molecules effusing from all the cells. The

molecules, as they exit from each effusion cell, are directed to strike a hot ionizing surface where the neutral atoms are



ionized. The ions are then extracted from the ion chamber to be deposited on some substrate.

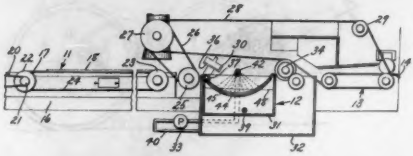
3,566,830
FLUIDIZED BED APPARATUS
Hermann Jakob Flamm, Bournemouth, England, assignor to United Kingdom Atomic Energy Authority, London, England
Filed Oct. 1, 1968, Ser. No. 764,160
Claims priority, application Great Britain, Oct. 9, 1967, 46028/67
Int. Cl. C23c *11/10*
U.S. Cl. 118—48 **3 Claims**



A fluidized bed vessel has a fluid injection assembly arranged to inject process gas and fluidizing fluid into the vessel via separate coaxial orifices. The construction of the assembly is such as to provide two annular injection orifices for fluidizing fluid. These orifices serve to direct fluidizing fluid over the wall of the vessel and over the process gas injection orifice. The assembly gives fine control over the concentricity of the orifices.

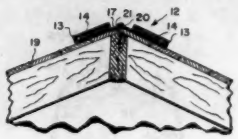
3,566,831
PRINT TONER BATH AND FEED CONSTRUCTION FOR PHOTOCOPIER DEVICES
David L. Herman, 63 Catherine Road, Scarsdale, N.Y. 10583
Filed Sept. 27, 1968, Ser. No. 763,242
Int. Cl. B05c *5/00*
U.S. Cl. 118—304 **1 Claim**

A toner bath apparatus including a tray having a curved upper surface open which a sheet of exposed, sensitized paper travels, and a toner spray device extending above the curved tray and dispensing an elongated spray of toner of substantial angular extent whereby the spray impinges upon



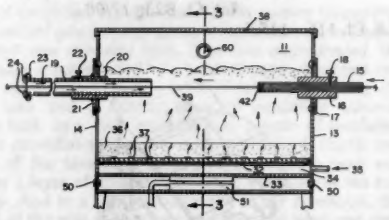
the surface of the paper and forces it to conform to the curvature of the tray.

3,566,832
ROOF TREATING DEVICE
Theodore M. Williams, 847 Daytona Ave, Holly Hill, Fla.
Filed Oct. 8, 1969, Ser. No. 864,738
U.S. Cl. 118—506 **8 Claims**



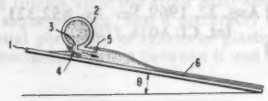
A holder or dispenser attached along the ridge of a roof and containing a chemical capable of being gradually dissolved by moisture so as to bleed from the holder and flow down the roof surface for cleaning the roof of stains and discolorations, for coloring the roof or for restoring the original color thereof.

3,566,833
CONTINUOUS COATING APPARATUS
Norman Percy Beebe, Ferrysburg, and Bruce Aubert Madeley, Manistee, Mich., assignors to Anaconda Wire and Cable Company, New York, N.Y.
Filed June 28, 1968, Ser. No. 741,093
Int. Cl. B05b *5/00*
U.S. Cl. 118—634 **3 Claims**



A magnet wire is prepared by first passing a copper wire through a dense cloud of electrostatically charged and finely divided plastic particles such as epoxy powder held within a confined chamber and being created by a spray gun positioned within the chamber and below the elongated member and in combination with a fluidized bed of a similar or a different plastic powder and then passing the electrostatically coated wire through an oven maintained at a temperature sufficiently high to fuse the electrostatically deposited plastic particles thereon to form an insulation film on the wire.

3,566,834
ELECTROPHOTOGRAPHIC DEVELOPING DEVICE
Yasuo Tamai; Satoru Honjo; Seiji Matsumoto, and Masamichi Sato, Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Sept. 19, 1968, Ser. No. 772,059
Int. Cl. B05b *5/00*
U.S. Cl. 118—637 3 Claims



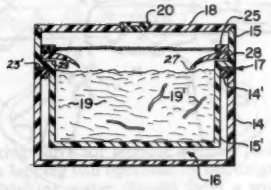
An electrophoretic developing device having an inclined conductive surface with a clamping means provided near the top of said surface for an electrophotosensitive sheet opposite to said surface. A liquid developer is intermittently supplied from a suitable feed means so as to provide a film of liquid between the conductive surface and the sheet.

3,566,835
PERFLUOROALKYLENE ETHER AND THIOETHER TRIAZINE COMPOUNDS
George A. Grindahl; Ogen R. Pierce, and John R. Greenwald, Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.
No Drawing. Filed Oct. 28, 1968, Ser. No. 771,291
Int. Cl. C07d *55/50*
U.S. Cl. 260—248 7 Claims

The invention provides triazines of the formula

Y being a perfluoroalkylene radical containing at least one ether or thioether linkage, R_f being a monovalent polyfluorinated hydrocarbon radical of no more than 12 carbon atoms, X being bromine or iodine. Triazine polymers of these compounds are also disclosed, as heat-stable elastomers.

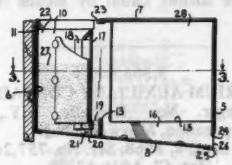
3,566,836
PORTABLE WORM-BREEDING CHAMBER
Merna A. Elfert, 2807 Byron, Odessa, Tex.
Filed Apr. 14, 1969, Ser. No. 815,985
Int. Cl. A01k *01/00, 29/00*
U.S. Cl. 119—1 5 Claims



A portable worm-breeding chamber having an upwardly opening enclosure member within which there is disposed a worm excluder with the worm excluder having a central opening therein which defines an opening into the chamber. The worm excluder has a curved edge portion which presents a barrier impossible for the worms to negotiate when they attempt to crawl out of the breeding chamber.

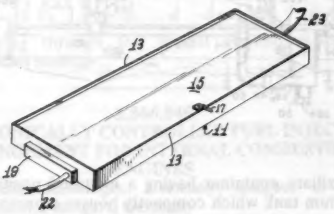
3,566,837
CHINCHILLA DUST BATH APPARATUS
John H. Denham, Route 1, Weir, Kans.
Filed Apr. 28, 1969, Ser. No. 819,827
Int. Cl. A01k *67/00*
U.S. Cl. 119—1 5 Claims

Dust bath apparatus comprises a boxlike structure mounted in an elevated position and includes a hopper for containing bath dust which empties through a low slot into a trough, the trough opening into an adjacent animal chamber



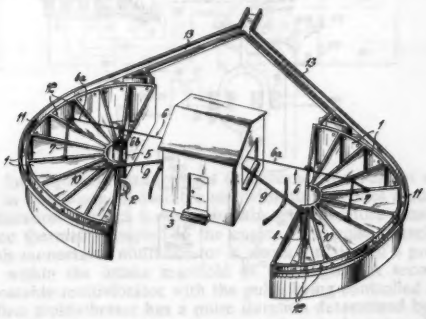
having a sloping floor with a discharge opening at the lowermost portion.

3,566,838
ANIMAL COMMODE
William A. Edwards, 347 South Division, Harvard, Ill.
Filed July 11, 1969, Ser. No. 841,075
Int. Cl. A01k *01/00, 23/00*
U.S. Cl. 119—1 3 Claims



An animal commode comprised of a shallow pan having a nonskid bottom surface and formed with an internal flange adjacent to its top edge to support a platform that can be turned over readily to deposit excrement thereon into the pan. A heater element is enclosed within the pan for drying out the excrement.

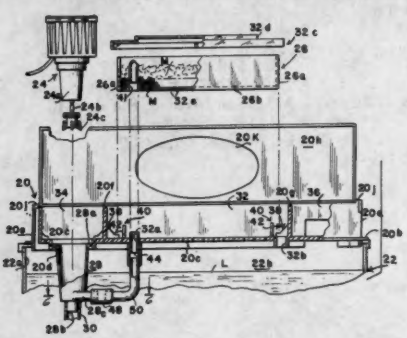
3,566,839
FISHPOND SYSTEM
Eugen Hilble, Heinrich Otto-Str.6, 7906 Herrlingen near Ulm, Germany
Filed July 31, 1969, Ser. No. 846,438
Claims priority, application Switzerland, Aug. 2, 1968, 11605/68
Int. Cl. A01k *61/00*
U.S. Cl. 119—3 9 Claims



A fishpond system for the controlled feeding and sorting of fish which consists of a plurality of ponds of sector-shaped

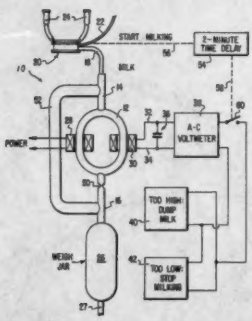
outline arranged in two semicircular clusters around two spaced retrieval pits located on opposite sides of a fish-sorting cabin. The two retrieval pits accommodate retrieval baskets which, after being loaded with water and fish, are transferred to the sorting cabin by means of a hoist and cableway.

3,566,840
AQUARIUM AUXILIARY CONTAINER
Allan H. Willinger, New Rochelle, N.Y., assignor to Metaframe Corporation, Maywood, N.J.
Filed Sept. 4, 1968, Ser. No. 757,265
Int. Cl. A01k *63/00*
U.S. Cl. 119—5 **4 Claims**



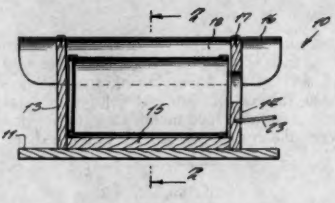
An auxiliary container having a mounted position within an aquarium tank which compactly houses a pump and filter assembly and also forms the fluid connections for an efficiently operating water recirculation filtration system of which the pump and filter assembly are integral parts. The filter assembly is additionally readily removable for replacement of the filter material and, when replaced, readily establishes the necessary fluid connections for efficient operation of the filtration system.

3,566,841
MILK MONITOR AND SYSTEM
John B. Gerrish, and William G. Bickert, East Lansing, Mich., assignors to Research Corporation, New York, N.Y.
Filed July 11, 1969, Ser. No. 840,950
Int. Cl. A01j *05/00, 07/00*
U.S. Cl. 119—14.15 **5 Claims**



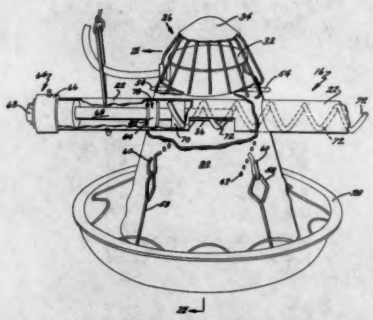
A milking system is provided in which an electrodeless conductivity meter continuously monitors milk from each cow and sensed data from each of the meters determines when milking is complete and screens for abnormal milk. The meter may be incorporated in a system to sequentially activate various relays and timers connected to automatic stall gates, washers, feeders, etc., to thereby reduce to a minimum man-time normally required during milking procedures.

3,566,842
BIRDHOUSE WITH REPLACEABLE LINER
Lewis K. Oldaker, Rte 1, Utica, Ohio
Filed Aug. 22, 1969, Ser. No. 852,321
Int. Cl. A01k *31/00*
U.S. Cl. 119—23 **4 Claims**



A house for birds, the birdhouse being comprised of a wooden enclosure with a removable sheet metal roof so as to gain access to the interior of the enclosure for the purpose of placement of an empty tin can therewithin, the tin can having an open end which is aligned with a small opening in one end of the enclosure so to allow access of birds thereinto, the tin can being readily replaceable with a fresh tin can after a season of use by birds.

3,566,843
POULTRY FEEDER PAN FOR AUGER-TYPE FEEDERS
Robert L. Van Huis, and Dee Dexter Allen, Zeeland, Mich., assignors to U. S. Industries, Inc., New York, N.Y.
Filed Apr. 16, 1968, Ser. No. 721,720
Int. Cl. A01k *05/00*
U.S. Cl. 119—53 **15 Claims**



A poultry feeder pan and supply conveyor arrangement, of the type wherein the supply conveyor has an opening in its bottom through which feed is dropped into the feeder pan, wherein the feeder pan includes a baffle plate and a platelike feeler arm spaced from the latter and positioned parallel thereto, to thereby define a channel which confines the feed dropped into the feeder pan for better sensitivity and increased reliability of a switching means controlled by such feeler arm. Where the supply conveyor is an auger operating within a tubular housing, the structure of the invention includes an arbor shaft rotatably mounted within such housing, along the axis of the auger, and having a circular pluglike member mounted on the shaft immediately downstream of the aforementioned feed-drop opening in the tubular auger housing, to which the downstream end of the auger is

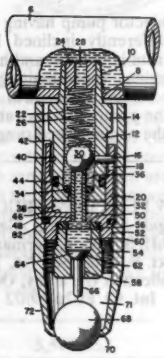
secured and which provides an anchor therefor. This pluglike member positively impedes the passage of feed along the conveyor tube beyond the opening in the latter through which feed drops into the feeder pan, such that all feed is, in effect, blocked within the auger tube and thrust downward into the feeder pan. Further, a circular disclike bearing is secured to the arbor shaft immediately downstream of the aforementioned pluglike member to support the arbor shaft at such point and, at the same time, to positively block any feed from working its way downstream beyond that point. This bearing rotates upon the arbor shaft and against the inside of the auger housing, and it preferably has an outer or circumferential periphery of lubricous plastic or the like to reduce the frictional contact between it and the auger housing.

3,566,844

DRINKING VALVE FOR LAPPING ANIMALS

Alfred J. Occhiodori, Cincinnati, Ohio, and James A. Turton, Florence, Ky., assignors to The Fieldstone Corporation, Cincinnati, Ohio

Filed Feb. 6, 1969, Ser. No. 797,126
Int. Cl. A01k *07/00, 09/00*
U.S. Cl. 119—72.5 **12 Claims**



The drinking valve for lapping animals includes a lapping nozzle and a lapping ball operated by the tongue of an animal to release drinking water thereto from a source of supply. Elements of the valve subject to animal contact are quickly and easily replaceable without effort, and without spillage or leakage of water onto the floor of a cage or runway.

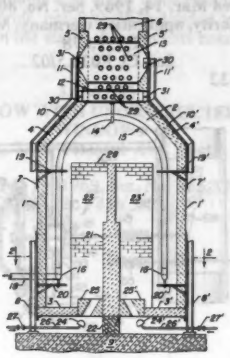
3,566,845

HEATER FOR FLUIDS PROVIDING ZONE HEATING

Marion W. Barnes, Glenview, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Sept. 4, 1969, Ser. No. 855,324
Int. Cl. F22d *21/30*
U.S. Cl. 122—240 **4 Claims**

An updraft form of fluid heater having a continuous fluid heating conduit formed from the interconnecting of a plurality of spaced-apart and inverted U-tube sections that are positioned transversely across the interior of the heater. Burners are spaced longitudinally along the central and lower portion of the heater to provide for radiant heating to the fluid conduit and, as desired, spaced transverse partitioning walls in the interior of the heater between certain of the spaced burners provide for maintaining controlled "zone heating" to the fluid carrying through the special continuous radiantly heated conduit section.

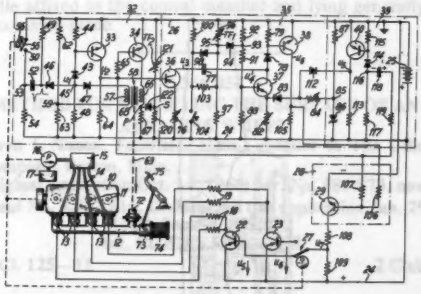


3,566,846

ELECTRONICALLY CONTROLLED FUEL INJECTION ARRANGEMENT FOR INTERNAL COMBUSTION ENGINES

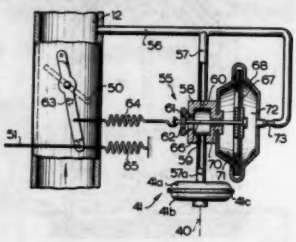
Otto Glockler, Renningen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 20, 1969, Ser. No. 800,851
Claims priority, application Germany, Feb. 23, 1968, P 16 01 367.5
Int. Cl. F02d *5/00*
U.S. Cl. 123—32 **25 Claims**



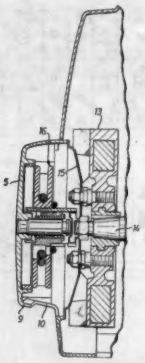
A fuel injection arrangement for internal combustion engine in which one monostable multivibrator provides a pulse the duration of which is determined by a temperature-sensing device thermally coupled to the engine. The pulse duration of this monostable multivibrator is also a function of a pressure within the intake manifold of the engine. A second monostable multivibrator with the pulse being controlled by the first multivibrator has a pulse duration determined by a second and separate temperature-sensing device at a different location from the first temperature-sensing device. The quantity of fuel injected is determined by the combination of the pulse durations of the two multivibrator circuits.

3,566,847
FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINES
Hermann Scholl, Stuttgart-Kaltental, and Hermann Hoelle, Stuttgart W., Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany
Filed Mar. 14, 1969, Ser. No. 807,334
Claims priority, application Germany, Mar. 29, 1968, 1,751,078
Int. Cl. F02d 5/02
U.S. Cl. 123—32 5 Claims



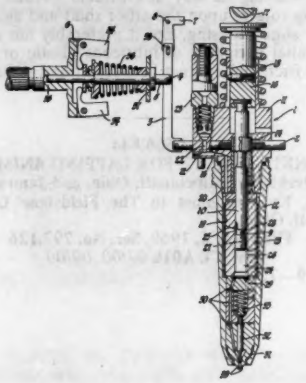
A fuel injection system for internal combustion engines wherein the fuel injection valves admit fuel into the intake manifold at a frequency which is a function of rotational speed of the engine and for intervals whose length is a function of manifold pressure when the throttle in the intake manifold is at a standstill. An overriding device which is actuated by the throttle causes the fuel injection valves to extend the length of intervals of fuel admission beyond such length which reflects the then prevailing manifold pressure when the throttle is moved toward open position.

3,566,848
PORTABLE POWER-DRIVEN CHAIN SAWS
Gunther H.W. Dobbertin, Ovre Olskroksgatan 28, Goteborg, Sweden
Filed June 28, 1968, Ser. No. 741,189
Claims priority, application Sweden, June 30, 1967, 9898/1967
Int. Cl. B27b 17/02
U.S. Cl. 123—41.65 1 Claim



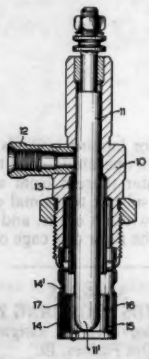
The present portable engine-driven chain saw has a casing for the engine with a side air inlet opening facing a fan-impeller attached to the engine drive shaft for cooling the engine, a cover for said casing opening having a front wall with air inlet openings and sidewalls spacing said cover front wall from said fan-impeller providing an area in which is positioned a perforated strainer plate attached to said drive shaft between said front wall and said fan-impeller for catching impurities such as sawdust, wood chips, pieces of bark or snow coming in with the air and throwing such impurities by centrifugal force through openings in said cover sidewalls away from the operator's face.

3,566,849
FUEL INJECTOR PUMP AND LIMITING SPEED GOVERNOR FOR INTERNAL COMBUSTION ENGINE
Charles H. Frick, Pontiac, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed July 28, 1969, Ser. No. 845,403
Int. Cl. F02m 45/00
U.S. Cl. 123—140 6 Claims



A jerk-type fuel injector pump having a rotatively adjustable plunger with differently inclined helix portions controlling the delivery rate in the low and high ranges of adjustment, and an engine speed-limiting governor having flyweights operative under the control of a relatively high rate spring to limit the pump delivery rate over approximately the upper half of the engine speed range.

3,566,850
GLOW PLUG CONSTRUCTION
Otto Beesch, Stuttgart-Sonnenberg, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany
Filed Oct. 9, 1968, Ser. No. 766,177
Claims priority, application Germany, Oct. 18, 1967, B 37123
Int. Cl. F02p 19/02
U.S. Cl. 123—145 2 Claims



A glow plug has a housing provided with an internal passages which is bounded by an inner circumferential surface and has an open front end. An elongated glow pin is carried by the housing rigid therewith and extends with radial clearance through the passage. A forward portion of the pin is located inwardly adjacent the open front end of the passage and ignition of the fuel takes place in the region of this forward front end portion. An annular insert is mounted in the passage concentrically surrounding the forward end portion of the pin and defining annular clearances with the

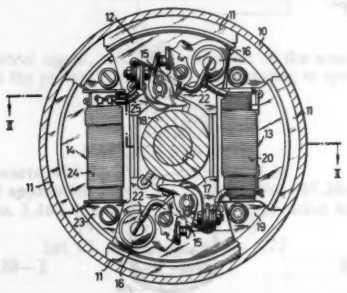
same and with the inner circumferential surface bounding the passage.

3,566,851

MAGNETO FOR MULTICYLINDER ENGINES OF AUTOMOTIVE VEHICLES

Gustav Pfrommer, Stuttgart-Oberturkheim, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 20, 1969, Ser. No. 800,997
Claims priority, application Germany, Mar. 7, 1968, P 16 63 168.8
Int. Cl. F02p *1/00*
U.S. Cl. 123—149 **10 Claims**



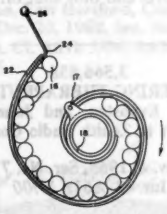
A rotating magnet-type magnetos for use with multicylinder engines of automotive vehicles wherein a rotor with several equidistant radially magnetized permanent magnets carries a breaker cam which opens one of two sets of breaker contacts when the other set is closed and vice versa. Each set of breaker contacts is connected with one end of a winding in one of two armatures which are mounted on a stationary plate adjacent to the path of movement of permanent magnets. The armatures overlie each other and are magnetically connected in parallel with each other. The other end of each winding is connected with the ignition coil. The plate carries an auxiliary armature which can supply current to the lighting system of the vehicle.

3,566,852

SPRING-TYPE END-WEIGHTED ROPE REEL CHAFF DISPENSER

Ramon I. Padron, Levittown, Pa., assignor to the United States of America as represented by the Secretary of the Air Force

Filed Oct. 11, 1968, Ser. No. 766,692
Int. Cl. F41b *15/00*
U.S. Cl. 124—6 **7 Claims**



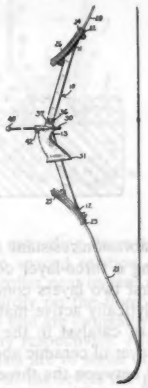
Reellike compartments stacked on a common axis. A steel spring is seated in archimedian spiral grooves in the discs of each reel and forms a ramp along which a series of subassemblies is installed. The bias of the spring is to rewind itself about the central axis of the reel causing shortening of the ramp and capsule ejection, with successive decreases in velocities from maximum to zero. Each subassembly comprises telescoping elements held compressed between the discs. Each contains a length of rope. Time delayed means spins each hub individually. The ramps of successive compartments intersect the periphery of the device with angular separations so that capsules can be ejected simultaneously from each compartment with equal velocities but with vector or angular separations, equal to 360° divided by the number of compartments in the stack; this prevents entanglement.

3,566,853

ARCHERY BOW WITH UNOBSTRUCTED SIGHT WINDOW

Kenneth O. Larm, 7200 Pleasant Ave. South, Minneapolis, Minn.

Filed Oct. 10, 1969, Ser. No. 865,370
Int. Cl. F41b *5/00*
U.S. Cl. 124—24 **8 Claims**



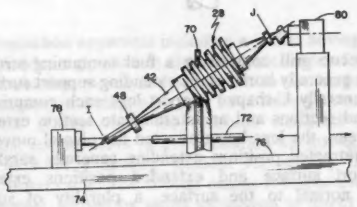
A bow including a rigid metal elongated member having limbs attached to each end thereof so that the axes of the limbs lie generally in a common plane and the central member is offset laterally from said plane to provide an unobstructed view of the target area and a pistol-grip type handle affixed to the central member and lying generally in the common plane.

3,566,854

METHOD FOR MODIFYING THE SURFACE OF AN ABRADING WHEEL

Warren I. Nissen, Topsfield, Mass., assignor to The Gillette Company, Boston, Mass.

Original application Oct. 14, 1966, Ser. No. 586,873, now Patent No. 3,461,616. Divided and this application Jan. 29, 1969, Ser. No. 832,872
Int. Cl. B24b *53/00, 1/00*
U.S. Cl. 125—11 **2 Claims**



The surface configuration of a tapered abrading wheel is modified to provide a straight line of intersection between two tapered abrading wheels when those abrading wheels are

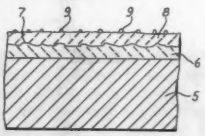
mounted for rotation about parallel axes by fixing the axis of the abrading wheel at a location parallel to a line that does not intersect and is not parallel to the axis of the dressing wheel, and relating the axis of a dressing wheel to that line such that rotation of the axis of the dressing wheel about that line would generate a true hyperboloid of revolution, and then simultaneously rotating the abrading and dressing wheels while the surfaces of the abrading and dressing wheels are in contact to modify the surface of the abrading wheel and produce a surface that closely approximates a portion of a true hyperboloid of revolution.

3,566,855

SELF-CLEANING COOKING APPARATUS

Curtis L. Morgan, Sigel, Ill., assignor to Fedders Corporation, Edison, N.J.

Filed Oct. 21, 1969, Ser. No. 868,007
Int. Cl. A21b *1/00*
U.S. Cl. 126—19 **18 Claims**



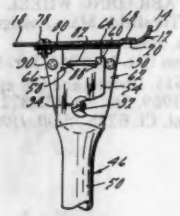
A self-cleaning, abrasion-resistant surface for a cooking apparatus comprising a three-layer coating on a metal surface, each of the first two layers comprising a mixture of a ceramic and a catalytically active material, with, preferably, increased amounts of catalyst in the second coating layer, and an interrupted layer of ceramic above the two-layer coating. Improved bond between the three-layer coating and the base structure of the cooking apparatus can be achieved through the use of a sandwiched ceramic layer.

3,566,856

BARBECUE GRILL

Robert S. Linstead, Rockford, Ill., assignor to King-Seeley Thermos Co., Ann Arbor, Mich.

Filed Nov. 26, 1968, Ser. No. 778,980
Int. Cl. F16m *11/38;* **F24b** *3/00;* **F24c** *15/08*
U.S. Cl. 126—25 **15 Claims**



A barbecue grill comprising a fuel containing structure defining a generally horizontally extending support surface, a pair of generally U-shaped support legs each comprising a pair of end sections and an intermediate section extending therebetween, the legs being adapted for pivotal movement between retracted positions extending generally parallel to the support surface and extended positions extending generally normal to the surface, a plurality of support brackets having generally horizontally extending support portions adapted to be fixedly secured to the surface and mounting portions extending generally perpendicular to the surface, means pivotally securing each of the leg end sections to one of the brackets, each of the brackets having an abutment flange section and a pair of detent embossments projecting from one side of the mounting portion thereof, and locking tang means provided adjacent the ends of each of the legs and adapted to be received between the abutment flanges and the adjacent of the detent embossments for releasably maintaining the legs in their respective extended positions.

3,566,857

SELF-HEATING CONTAINER

Dan M. Price, P.O. Box 308, Litchfield, Ill.

Filed Apr. 14, 1969, Ser. No. 816,008
Int. Cl. A47g *23/04*
U.S. Cl. 126—262 **10 Claims**

A package product is completely ensealed within a container formed of heat-conducting material and joined along its upper rim to the upper edge of a shell to thus be disposed within the upper portion of said shell. The shell, preferably, has the same cross sectioned configuration as the body of said container, the configuration of said shell being larger than that of said container body so as to provide an air gap therebetween. The shell is provided with vents communicating with said air gap, and the bottom of said shell is enclosed by an end structure supporting interiorally of the shell a supply of fuel preferably in solid form. Surrounding said shell and substantially coextensive therewith is a slideably fitted sleeve formed of heat insulating material provided with ports near its bottom edge. In the normal position of the sleeve relative to the shell, the ports or vents in each are covered by the structure of the other. To prepare the package for its heating function, the sleeve is displaced relatively to the shell either downwardly or circumferentially a sufficient distance to fully expose the ports or vents in both the sleeve and shell which complete an air circulation path through the shell after its bottom end closure is ruptured, the fuel ignited and the package placed to rest on any suitable flat surface. To extinguish, the sleeve and the shell are displaced relative to each other to close the ports and thus shut off any air to the fuel supply.

3,566,858

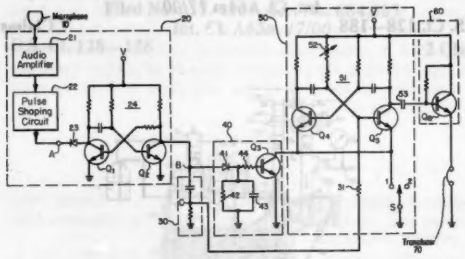
ANTISTUTTERING THERAPEUTIC DEVICE

Stephen R. Larson, Evanston, and John C. Sinclair, Oak Park, Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Filed Nov. 4, 1968, Ser. No. 773,068
Int. Cl. A61b *19/00*
U.S. Cl. 128—1 **8 Claims**

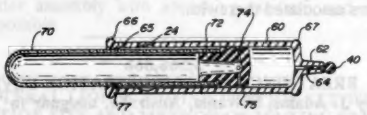
A therapeutic device which provides voice masking to assist a patient in overcoming a speech deficiency such as stuttering. A microphone, selectively responsive to the patient's voice, receives his speech and converts it into electrical signals which are utilized to develop a control signal. An audio oscillator generates an audiofrequency pulsed wave which is varied in frequency in proportion to pitch changes in the patient's voice by a circuit responsive to the control signal. An output transducer converts the audiofrequency

pulsed wave into a corresponding sound wave which is applied to the patient's ear. A switching circuit, also responsive



to the control signal, enables application of the sound wave only while the patient is speaking or attempting to speak.

3,566,859
VACUUM SYRINGE
Boris Schwartz, 400 Park Ave., Paterson, N.J.
Original application June 12, 1967, Ser. No. 645,264, now Patent No. 3,464,412. Divided and this application Aug. 29, 1969, Ser. No. 854,090
Int. Cl. A61b *5/14;* **A61m** *5/22*
U.S. Cl. 128—2 **5 Claims**



A syringe combination having an outer housing and a hollow plunger providing a pair of chambers of determined size. The plunger is provided with a piston having three or more spaced, ringlike sealing surfaces and with a fluid passageway from the interior of the plunger which is flow-connected to the outer piston surface and between ringlike sealing surfaces. The outer housing has one or more recesses of determined size formed in its inner surface with the recesses positioned near the open end of the housing and of a length so that the rearmost sealing surface of the plunger piston engages the housing between the recesses and the rear end of the housing when the flow-connection is brought into a fluid-conducting position with the recess.

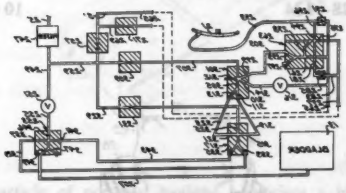
3,566,860
CARBON-IMPREGNATED BODY ELECTRODE
Lucas H. Moe, Jr., Andover, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.
Filed Dec. 20, 1968, Ser. No. 785,577
Int. Cl. A61b *5/04;* **A61n** *1/02*
U.S. Cl. 128—2.06 **1 Claim**

A carbon-impregnated plastic or metallic male electrode is disposed within a body contacting adhesive coated web, the electrode being secured to the skin of a patient by the adhesive for the purpose of conducting electrical currents to and from the body of the patient. A conductive paste or jelly may be used to enhance conduction through the junction of the electrode with the body, if desired.

3,566,861
EXERCISER AND PHYSICAL REHABILITATION APPARATUS
Eugene Weiss, Merrick, N.Y., assignor to Beacon Enterprises, Inc., New York, N.Y.
Filed Apr. 18, 1969, Ser. No. 817,353
Int. Cl. A61h *1/02*
U.S. Cl. 128—25 **7 Claims**

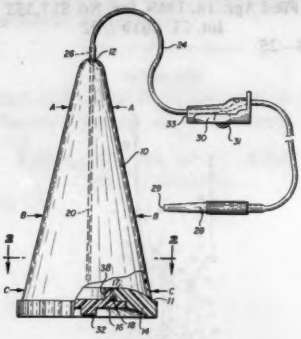
Two upright levers extending down to near the floor, are swingably mounted in spaced relation on a stand. Each of two foot pedals has a roller near its rear end to roll on a track which extends rearwardly on the floor from the stand, and said pedals at forward end are swingably mounted to the bottom end of said levers respectively. All axes are horizontal and parallel. The pedals are to stand on, and for most exercises the upper parts of the levers are grasped in hand. The pedals are near alongside each other. The handle portions are further apart.

3,566,862
RESPIRATION APPARATUS
Paul A. Schuh, 3428 Alabama, San Diego, Calif., and Ralph C. Hagley, 5054 San Joaquin Drive, San Diego, Calif.
Filed Aug. 1, 1968, Ser. No. 749,513
Int. Cl. A61h *31/02*
U.S. Cl. 128—30.2 **9 Claims**



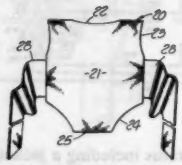
Respiration apparatus including a jacket having a collapsible bladder supported in the abdominal area of the patient. Pressurization means are connected to the bladder by conduit means; including a control valve having an exhaust port. Control means which may include cascaded fluidic amplifiers, controls flow of pressurization air through the valve and includes a sensing element for sensing the patients respiration cycle. The control means is responsive to a positive signal, caused by initial exhalation to direct air flow to the bladder to depress the abdominal muscles and assist the patient in exhaling. The control means is also responsive to a negative signal, caused by initial inhalation, to close the control valve and exhaust the bladder out the exhaust port.

3,566,863
GAS-PRESSURIZED WASHING DEVICE
Richard D. Law, 2291 Youngfield St., and Robert E. Eckels, 2101 Youngfield St., Golden, Colo. 80401
Filed May 1, 1969, Ser. No. 820,971
Int. Cl. A61h 9/00
U.S. Cl. 128—66 7 Claims



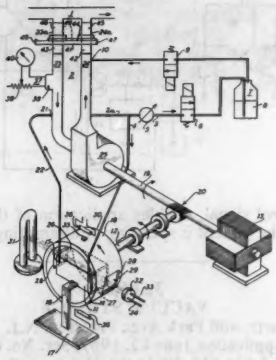
An aqueous solution cleaning or washing device, using effervescent salts to generate delivery gas pressure, includes a conical chamber having its side subtending an angle of 30 to 75° exposing minimum liquid surface area at maximum fill to maximum area at minimum fill to contained gas under pressure, provides an essentially uniform delivery pressure throughout the discharge of solution from the unit. The device issues a pulsing jet of solution providing a cleaning unit for use on teeth and gums, for medicinal irrigation, a medicinal douch, etc.

3,566,864
INFANT SAFETY GARMENT HAVING INTEGRAL MEANS FOR SECURING THE SAME
William Peter Garrow, 5504 Dodsworth Ave., Glendora, Calif., and Rex L. Neuman, 18313 St. Marys, Detroit, Mich.
Filed July 22, 1968, Ser. No. 746,633
Int. Cl. A61f 13/00
U.S. Cl. 128—134 10 Claims



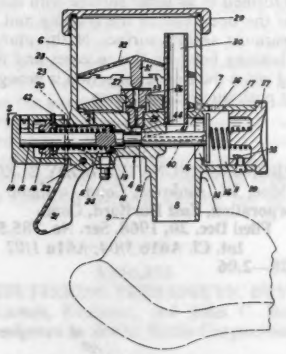
A garment which is fitted about the body of the user and has elongated portions extending therefrom which may secure a body to a relatively stable object so as to maintain the garment, and concomitantly the user's body, in a predetermined position. The garment of the invention permits unlimited movement of the head or limbs of the user while permitting limited movement of the user within the garment.

3,566,865
ANESTHESIA SYSTEM
Wayne W. Hay, Madison, Wis., assignor to Air Reduction Company, Incorporated, New York, N.Y.
Filed June 12, 1968, Ser. No. 736,427
Int. Cl. A61m 17/00
U.S. Cl. 128—188 7 Claims



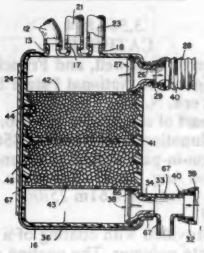
An anesthesia system having a main circuit and a sample bypass, said bypass being manually opened and closed to gas flow from the main circuit by a zeroing valve and having an oxygen analyzer, an anesthetic analyzer and automatic controllers associated therewith.

3,566,866
BREATHING AID ADMINISTRATION DEVICE
Henry J. Adams, Sulvania, Australia, assignor to The Commonwealth Industrial Gases Limited
Filed Aug. 8, 1967, Ser. No. 659,160
Claims priority, application Australia, Aug. 10, 1966, 9497/66
Int. Cl. A62b 7/00
U.S. Cl. 128—145.8 5 Claims



A breathing aid device for administration of a gas to a patient comprising: a valve casing connected to a source of gas under pressure, a liquid reservoir located on the casing and a gas discharge outlet duct on the casing adapted for attachment thereto of an administration element, and a valve for controlling the flow of gas from the source to the outlet by way of the liquid reservoir. The valve is arranged so that when flow of gas to the outlet is halted the outlet is automatically opened to the atmosphere.

3,566,867
UNITARY DISPOSABLE CIRCLE ABSORPTION CANISTER ASSEMBLY
Gale E. Dryden, Indianapolis, Ind., assignor to Dryden Corporation, Indianapolis, Ind.
Filed Nov. 17, 1967, Ser. No. 684,005
Int. Cl. A63m *17/00*
U.S. Cl. 128—188 2 Claims

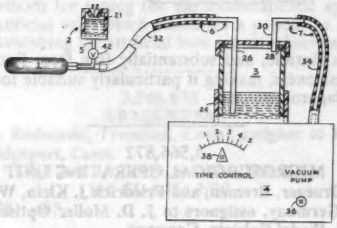


A circle absorption system for anesthesia including a gas machine, a carbon dioxide absorbing canister assembly with corrugated inner wall surface, a gas supply hose thereto, rebreathing hoses and a mask connected thereto, an absorbing medium therein, and one-way valves mounted therein, the canister assembly with absorbing medium and valves being disposable.

3,566,868
PARENTERAL LIQUID ADMINISTRATION SET WITH INJECTION SITE AND METHOD OF MAKING SAME
Victor H. Baptist, Burbank, and Mitchell B. Brodkin, Los Angeles, Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.
Filed Aug. 26, 1968, Ser. No. 755,184
Int. Cl. A61m *5/00*
U.S. Cl. 128—214 8 Claims

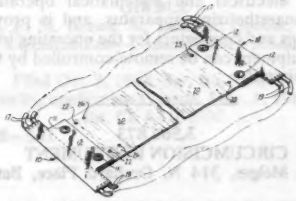
An administration set in the form of a tubular conduit for draining blood, dextrose solutions, et. from a container to a patient's vein. This administration set has an improved injection site made of a rubber tube length which has been turned inside out and which has an inner wall surface in a constant state of annular compression. The rubber tube length quickly and tightly reseals a puncture hole made by a needle of a hypodermic syringe used to inject additive medication into the administration set.

3,566,869
VACUUM-UTILIZING HYGIENIC TEETH-CLEANING SYSTEM
David Lamar Crowson, P.O. Box 798, Petal, Miss.
Filed Dec. 26, 1968, Ser. No. 787,167
Int. Cl. A61h *19/00*
U.S. Cl. 128—230 10 Claims



A system for cleaning teeth comprising a vacuum pump and a selected one of a number of mass-produced mouthpieces, fitting somewhat loosely over the user's teeth. Via the closed mouth and sealed tubular connections the pump's suction is placed on a measured quantity of liquid dentifrice, which may contain both a cleanser and an agent for preventing or inhibiting pyorrhea and tooth decay. After all the dentifrice is sprayed on and passes over the teeth the pump's motor automatically stops. The dentifrice and food particles are prevented from entering the pump by a water-containing trap in the suction line. Most of the parts are of synthetic plastic, formed in quantity production molds.

3,566,870
ARTICLE OF PERSONAL HYGIENE
Mina I. Benjamin, 5545 39th Ave.N.E., Seattle, Wash.
Filed Oct. 23, 1968, Ser. No. 814,470
Int. Cl. A61f *13/16*
U.S. Cl. 128—289 3 Claims

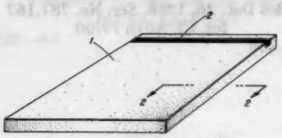


An article of personal hygiene comprises a hip-hugging belt having juxtaposed panels for disposition fore and aft in the pelvic region adapted to embrace and secure the ends of a crotch shield of absorbent sheet material.

3,566,871
HYDROPHILIC MEDICAL SPONGE AND METHOD OF USING SAME
Ferdinand Joseph Richter, and Charles Teets Riall, Danbury, Conn., assignors to American Cyanamid Company, Stamford, Conn.
Filed June 11, 1968, Ser. No. 736,181
Int. Cl. A61f *13/00*
U.S. Cl. 128—296 8 Claims

A hydrophilic polyurethane sponge adapted for medical usage, in which the sponge pores contain a surfactant coating

to accelerate absorption of body fluids into the pores at medically preferred rates, the fluids being retained therein by capillarity to affect removal of the fluids from the body. The

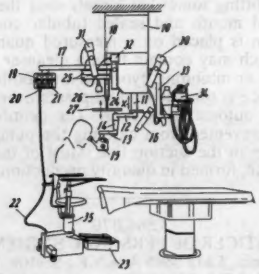


sponge is flexible, and substantially free from lint, toxicity, and abrasiveness, making it particularly suitable for use as a surgical laparotomy pad.

3,566,872
MICROSURGICAL OPERATING UNIT

Jorg A. Draeger, Bremen, and Friedrich J. Klein, Wedel, Holstein, Germany, assignors to J. D. Moller Optische Werke GmbH, Wedel Holstein, Germany

Filed Nov. 21, 1968, Ser. No. 777,797
Int. Cl. A61b *17/36*
U.S. Cl. 128—303.1 **5 Claims**

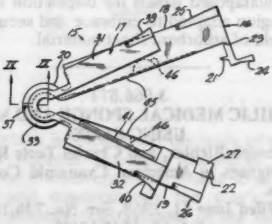


A microsurgical operating unit which is mounted on the ceiling of an operating theater. This unit serves to combine all of the apparatus necessary for carrying out a microsurgical operation, such as a microscope, the illuminating light sources, the electrical and pneumatical operating instruments, the anaesthetizing apparatus, and is provided with suitable fittings and connectors for the operating instruments. All of the equipment can be remote-controlled by the operating surgeon himself.

3,566,873
CIRCUMCISION INSTRUMENT

Frederick J. Melges, 314 N. Orchard Place, Battle Creek, Mich.

Filed Dec. 2, 1968, Ser. No. 780,463
Int. Cl. A61b *17/326, 17/08*
U.S. Cl. 128—305 **20 Claims**



This surgical instrument has a clamping and holding member of special construction especially suited for use in circumcision operations involving the use of conventional hospital instruments such as a probe, scalpel, and hemostat, for completing the circumcision operation, while in the preferred form the instrument will involve the use in combination of two main portions, with one of these being the clamping and holding member, and the other a cutting member, with the two members pivotally connected together and guided in cooperative operating position, and when the two main portions are principally formed of plastic, same can be discarded at the end of the operation without need of sterilization for reuse.

3,566,874
CATHETER

Thomas H. Shepherd, Hopewell, and Francis E. Gould, Princeton, N.J., assignors to National Patent Development Corporation, New York, N.Y.

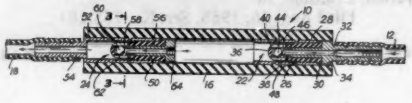
Continuation-in-part of application Ser. No. 654,044, July 4, 1967, and a continuation-in-part of 567,856, July 26, 1966, and a continuation-in-part of 650,259, June 30, 1967. This application Aug. 13, 1968, Ser. No. 752,221
Int. Cl. A61m *25/00*
U.S. Cl. 128—349 **12 Claims**

Catheters are provided with coating of a hydrophilic acrylate or methacrylate polymer. The coating reduces the irritation and infection normally accompanying the use of catheters. Infection can be reduced still further by absorbing an antibiotic in the coating.

3,566,875
DEVICE FOR DRAINING CEREBROSPINAL FLUID

Richard K. Stoehr, 12 Kuebler St., Blue Point, N.Y.

Filed May 20, 1969, Ser. No. 826,214
Int. Cl. A61m *25/00*
U.S. Cl. 128—350 **9 Claims**

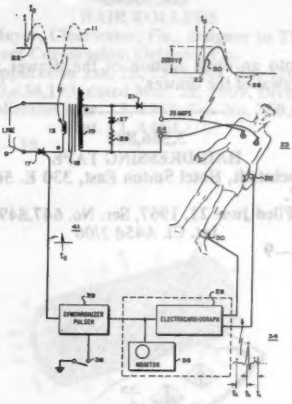


A device for draining cerebrospinal fluid automatically to the venous system in cases of hydrocephalus. The device includes an outer elastic tube which houses in its interior identically flow oriented upstream and downstream check (unidirectional) valves respectively communicating with the cerebrospinal fluid and the venous system. Each check valve includes an inner elastic tubular member within the outer tube and having an upstream open end and a downstream closed end. At the region of its downstream closed end each inner tubular member is formed with at least one axially extending slit which forms the outlet of the valve. Within each inner elastic tubular member is a freely movable ball member located in the region of the closed end of the inner tubular member where the slit is situated. A rigid tube is situated within each inner elastic tubular member and has a downstream end at a short distance from the closed end of the tubular member to provide the freely movable ball member with a restricted extent of axially free movement. Because of the free movability of this ball member within each check valve the interior thereof is kept clean, particularly at the region of the slits, and thus malfunctioning due to clot formations at the slit is reliably avoided. Moreover, since the slit extends to substantially the closed end of the tubular member, dead space in which blood can clot to obstruct flow is substantially eliminated and the danger of infection is substantially reduced.

3,566,876
DEFIBRILLATOR

Paul E. Stoft, Menlo Park, and Robert F. Shaw, San Francisco, Calif., assignors to said Stoft assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 14, 1967, Ser. No. 690,586
Int. Cl. A61n 1/36
U.S. Cl. 128—421 1 Claim

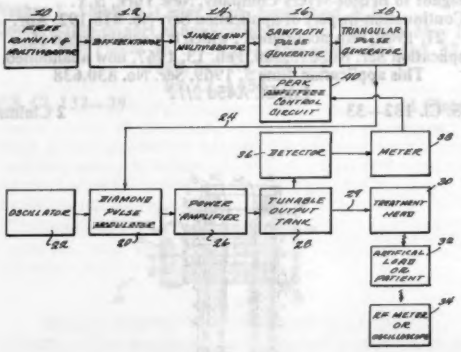


A monopolar cardiac defibrillator obviates the need for bulky storage capacitors by operating directly from line signal to supply a high power-defibrillating pulse substantially as a half-wave portion of the line signal the defibrillating pulse is generated in timed relationship to a patient's electrocardiogram by activating a signal-controlled switch to apply a half wave of line signal to the defibrillator circuitry.

3,566,877
ELECTROTHERAPEUTIC APPARATUS AND TREATMENT HEAD AND METHOD FOR TUNING SAID TREATMENT HEAD

Luther B. Smith, and Frank A. Yarger, Miami Beach, Fla.

Filed Jan. 5, 1968, Ser. No. 696,039
Int. Cl. A61n 1/40
U.S. Cl. 128—422 49 Claims

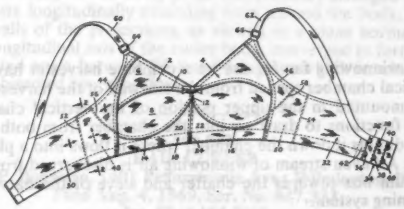


An electrotherapeutic apparatus is disclosed wherein diamond-shaped pulses of electromagnetic energy are produced by a pulse generator and applied to a treatment head which radiates the pulsed energy to a given load. A power amplification output stage of the pulse generator includes a tunable tank circuit. A detector is provided to determine whether the tank circuit is in its resonant state, the detector being transformer coupled to the tank circuit whereby the minimum current flowing through the detector corresponds to the resonant state of the tank circuit. Connected in series with the detector is a resistor network which permits the detector reading to be on-scale for each amplitude adjustment of the diamond-shaped pulses. Included within the treatment head is a further tunable tank circuit which comprises a tunable capacitor and an inductor, several embodiments of which are disclosed. The pulsed energy from pulse generator is transformer coupled to the tunable tank circuit of the treatment head, the primary winding of the treatment head transformer also being disclosed in several embodiments. Methods for tuning the electrotherapeutic apparatus with an artificial load which simulates a patient or the like and for establishing the artificial load are also disclosed.

3,566,878
BRASSIERES

Alfreda R. Radomski, Trumbull, Conn., assignor to Warnaco Inc., Bridgeport, Conn.

Filed Jan. 13, 1969, Ser. No. 790,561
Int. Cl. A41c 3/00
U.S. Cl. 128—489 1 Claim



An improved brassiere having nonelastic cups with an elastic area in the cup along the underarm side of the cup, an elastic back panel and an elastic, reinforced side panel, said side panel being formed by a section of fabric elastic in one direction and stretchable but nonelastic in the opposite direction superimposed on the fabric of said back panel with the direction of the elasticity of said back panel and said superimposed fabric substantially at right angle to each other.

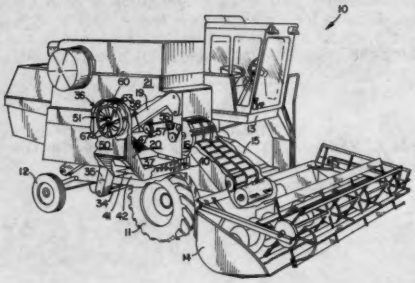
3,566,879
GIRDLE

Carmen M. E. M. Braun, St. Laurent, Quebec, Canada, assignor to Canadian Lady-Canadelle Inc., Montreal, Quebec, Canada

Filed Oct. 3, 1968, Ser. No. 764,757
Claims priority, application Canada, Mar. 1, 1968, 013,735
Int. Cl. A41c 1/00
U.S. Cl. 128—541 8 Claims

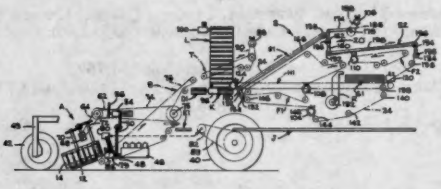
A girdle especially adapted to supplement the natural underlying muscle of the abdominal region. The girdle includes three sets of elastic panels which act in the same direction as the Transversus Abdominal Internal Oblique and External Oblique to effect control of the human figure. Coincidentally, the direction of the panels have a common focus at a point approximately on the hip of the wearer.

3,566,880
COMBINE-CLEANING SYSTEM
Glenn E. Riffe, East Moline, Ill., assignor to International Harvester Company, Chicago, Ill.
Filed July 7, 1969, Ser. No. 839,345
Int. Cl. A01f *12/48*
U.S. Cl. 130—27 **10 Claims**



A winnowing fan for use on a combine harvester having a vertical chamber spaced from the sidewall of the harvester. A fan mounted in the upper portion of the vertical chamber that functions to draw air into the chamber from both sides and directs it down the chamber where it flows into a plenum box. An even stream of winnowing air is discharged from the plenum box towards the chaffer and sieve of the harvester-cleaning system.

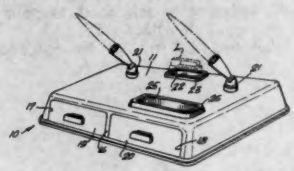
3,566,881
TOMATO HARVESTER SHAKING MECHANISM
Harold L. Link, and Ferdinand J. Dumanowski, San Jose, Calif. assignors to FMC Corporation, San Jose, Calif.
Filed Oct. 15, 1968, Ser. No. 767,736
Int. Cl. A01d *45/00*
U.S. Cl. 130—30 **8 Claims**



Tomatoes are shaken from their vines by an endless shaker conveyor comprising first and second linearly moving shaker sections which are independently oscillated in relatively opposite directions at a maximum velocity that exceeds the linear velocity of the shaker conveyor.

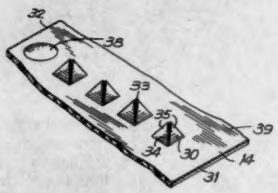
3,566,882
SMOKER'S DESK SET WITH AUTOMATIC TRAY DISCHARGE MECHANISM
Frank J. Schroeder, 4210 31st St. S., St. Petersburg, Fla.
Filed Nov. 3, 1969, Ser. No. 873,199
Int. Cl. A24f *19/08, 19/10*
U.S. Cl. 131—234 **8 Claims**

A smoker's desk set having an ash receiver below which is arranged a sliding ash receiver drawer having an upper plate portion which serves as the ash receiver bottom when the drawer is in place, and which serves, in cooperation with a peripheral bottom edge of the ash receiver sidewall, to scrape



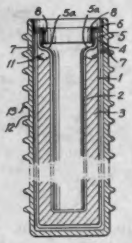
ashes etc. into an open section of the drawer for removal upon withdrawal of the drawer.

3,566,883
HAIRDRESSING TAPE
Adley H. Hochstadt, Hotel Sutton East, 330 E. 56th St., New York, N.Y.
Filed June 21, 1967, Ser. No. 647,849
Int. Cl. A45d *2/00*
U.S. Cl. 132—9 **5 Claims**



This invention is concerned essentially with a flexible adhesive tape for hairdressing purposes, including punctured portions, for ventilated attachment to and easy removal from a user's person. The instant invention also embraces an apparatus for tape manufacture wherein complementary rolls define a nip through which tape is passed and simultaneously pierced by coaction between projections on one roll and recesses on the other.

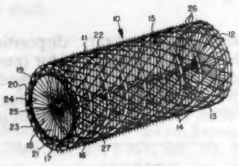
3,566,884
HAIRWINDER FOR USE IN CURLING HAIR
Arne Bybjerg Pedersen, Clarens (Montreux), Switzerland, assignor to Bristol-Myers Company, New York, N.Y.
Continuation-in-part of application Ser. No. 818,192, Apr. 21, 1969, now abandoned, which is a continuation of application Ser. No. 615,606, Feb. 13, 1967, now abandoned. This application June 5, 1969, Ser. No. 830,638
Int. Cl. A45d *2/12*
U.S. Cl. 132—33 **2 Claims**



A hair winder in which a tubular metal cap is inserted into a tubular metal container in spaced relation and wherein the cap has an open end of deformed S-shape which is in contact with the open end of the container, whereby an enclosed

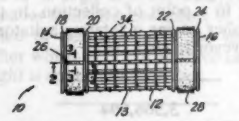
space is formed between the cap and container which is filled with a heat-accumulating substance adapted to be melted by heating before the hair winder is used, whereby heat is transferred to an outer curler element surrounding the metal container. An annular double wall metal closing ring of U-shaped section clampingly engages the container and the cap to form a hermetic sealed joint at their contacting open ends and the closing ring has an outer projection to anchor the curler element to the ring.

3,566,885
HAIR ROLLERS
Harry W. Meyer, Clearwater, Fla., assignor to The Industrial Development Corporation, Orlando, Fla.
Original application Jan. 18, 1965, Ser. No. 426,169, now Patent No. 3,434,193, dated Mar. 25, 1969. Divided and this application Mar. 13, 1968, Ser. No. 750,683
Int. Cl. A45d *2/12*
U.S. Cl. 132—39 **4 Claims**



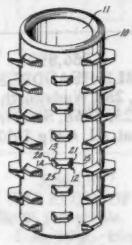
A hair roller has a brush and an internally supported tubular net component that is provided with shrunken filaments at its ends to retain the support in a proper position in the assembly. With heat shrinkable netting material, the filaments at the ends of the supported tubular component are heat shrunk and then followed with a water or air quench to ambient temperatures before the brush is inserted in the tubular net. Heating and quenching are accomplished with an apparatus having spaced heaters with associated quenching devices, and a carriage for conveying the internally supported tubular component through the heaters. The carriage is equipped with cam actuated holders for inverting the held items between heaters.

3,566,886
HAIR CURLER
Nathan L. Solomon, Cedar Lane, Englewood, N.J.
Continuation-in-part of application Ser. No. 728,663, May 13, 1968, now Patent No. 3,438,382. This application Oct. 17, 1968, Ser. No. 768,475
Int. Cl. A45d *2/12*
U.S. Cl. 132—39 **11 Claims**



A hair roller having at least one strip of material containing radially extending resilient hair gripping bristles mounted on the peripheral surface of the curler body and securely held in position without requiring stitching, such as by passing the ends of the strips through slots interiorly into the curler body, or positioning the strip in a slot with overlying edges along opposite strip edges and having a thickness substantially the same as the strip.

3,566,887
HAIR CURLER
Thomas F. Nelson, Stratford, Conn., assignor to General Electric Company
Filed Apr. 22, 1969, Ser. No. 818,338
Int. Cl. A45d *2/14*
U.S. Cl. 132—39 **8 Claims**

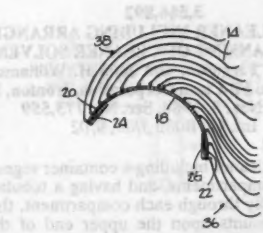


The disclosure herein concerns a hair curler that prevents tangling of the hair. The curler consists of a cylindrical body with an array of outwardly projecting elements arranged in at least six longitudinally extending rows around the body. The sidewalls of the projections, as viewed in a plane normal to the longitudinal axis of the curler body, converged to form an included angle between 25 and 50 degrees which is substantially bisected by radial lines.

3,566,888
HAIR CURLER
John P. Bonarigo, 1401 Pennsylvania Ave., Wilmington, Del.
Filed Aug. 4, 1969, Ser. No. 847,333
Int. Cl. A45d *2/18*
U.S. Cl. 132—40 **12 Claims**

A hair curler includes a tubular body having a continuous spiral slit so that the body may be distorted from its original tubular shape by the application of a pulling force to create a gap formed by the spiral slit. Hair-anchoring means are disposed at the slit in such a manner as to be shielded when the body is in its original tubular form and to be exposed when the body is distorted therefrom.

3,566,889
WIG CONSTRUCTION
Bernice Cole, New Hyde Park, and Miguel A. Marin, Brooklyn, N.Y., Bernice Cole, 10 Leslie Lane, New Hyde Park, N.Y.
Filed Aug. 9, 1968, Ser. No. 751,473
Int. Cl. A41g *3/00*
U.S. Cl. 132—53 **1 Claim**



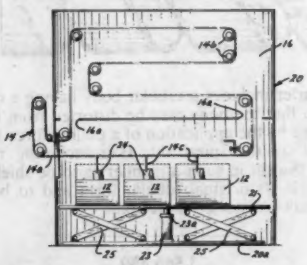
A wig which includes a base member of generally hemispherical shape and having hair secured to and distributed

over the area of the outer surface so as to overlie the top of the wearer's head and conceal the natural hair from view. The hair is trimmed to a generally shorter length toward one end and to a generally longer length toward the other end thereof so that when the wig is mounted on the wearer in one direction the wearer exhibits a relatively short hair styling effect, and when the wig is mounted on the wearer in the opposite direction the wearer exhibits a relatively long hair styling effect.

3,566,890
ADJUSTABLE HEADDRESS FRAME
Marjorie Mc Cullough, 258 Wadsworth Ave., New York, N.Y.
Filed Oct. 25, 1968, Ser. No. 782,502
Int. Cl. A41g *5/00*
U.S. Cl. 132—54 **8 Claims**

A headdress frame adjustable into a variety of positions to retain the hairdo in a selected configuration.

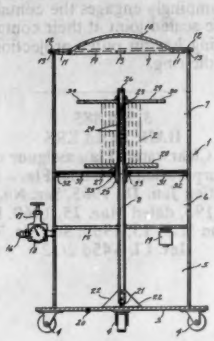
3,566,891
TANK ARRANGEMENT
Robert L. Koch, II, Evansville, Ind., assignor to Ashdee Corporation, Evansville, Ind.
Filed Oct. 7, 1968, Ser. No. 765,371
Int. Cl. B05c *3/10*; **B08b** *3/04*
U.S. Cl. 134—61 **3 Claims**



A tank arrangement particularly adapted for processing small parts characterized by the indexing of several tanks into processing position through simultaneous vertical movement.

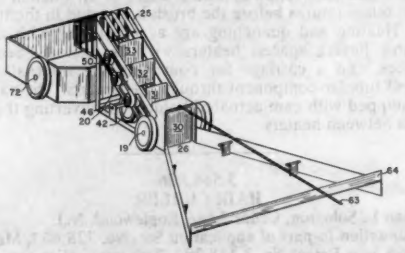
3,566,892
OIL FILTER CLEANER INCLUDING ARRANGEMENT FOR CLEANSING OF CLEANER SOLVENT
Russell F. Logue, Ferguson, and John H. Williams, Ironton, Mo., assignors to Fil-Clean Corporation, Ironton, Mo.
Filed Nov. 5, 1968, Ser. No. 773,559
Int. Cl. B08b *3/00*, *9/02*
U.S. Cl. 134—102 **8 Claims**

In an oil filter cleaner including a container segmented into three separate compartments, and having a tubular member extending vertically through each compartment, the oil filter to be cleaned mounts upon the upper end of the tubular member and air under pressure discharges into the lower compartment forcing the solvent settled therein to pass up through the tubular member and be discharged into and provade throughout the oil filter for effecting its cleaning. A filtering element is disposed intermediate the upper and middle compartments of the container so that as the solvent discharges from the oil filter, it is cleaned as it passes into the



middle compartment for temporary disposition before it drains back into the lower compartment for reusage. The upward end of the tubular member may be formed as a diffuser and cooperate with support means for mounting various sizes and embodiments of oil filters during the cleaning process.

3,566,893
BALL RETRIEVING DEVICE
Ray A. Richardson, 201 S. Eastbourne, Tucson, Ariz., and Helen M. Richardson, fiduciary
Filed Nov. 12, 1968, Ser. No. 774,779
Int. Cl. B60p *1/38*
U.S. Cl. 134—115 **8 Claims**

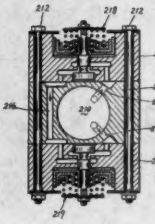


A device for retrieving objects such as golf balls from a ground area such as a driving range area and conveying them to a receptacle ready for reuse. The retriever device is mobile over the area and a V-shaped member extending from the device funnels the balls to the mouth of a conveyor having a series of rotating paddles which move the balls along an inclined conveyor to a point of collection. In the preferred embodiment a washer having a rotating agitator collects the balls from the conveyor to wash them.

3,566,894
HYDRAULIC PRESSURE GOVERNOR VALVE
Takehito Satoh, Yokohama, Japan, assignor to Isuzu Motors Ltd, Tokyo, Japan
Filed June 11, 1968, Ser. No. 736,102
Int. Cl. G05d *13/10*
U.S. Cl. 137—54 **21 Claims**

A hydraulic pressure governor valve which is connected so as to be driven by a rotary shaft has a valve casing, in which a sleeve valve is disposed within a radial bore formed in the valve casing so that when the shaft rotates, the centrifugal force acting upon the valve provides a regulated output i.e.,

governor pressure. A number of weights n are slidably disposed on the valve, on which are spring means which act



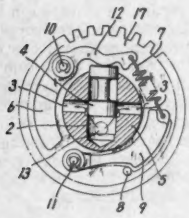
radially inwards, whereby the governor pressure can be regulated to increase in $(n + 1)$ steps in proportion to increasing speed of the shaft.

3,566,895

FLUID PRESSURE GOVERNOR

Isamu Goto, Tokorozawa-shi, Japan, assignor to Honda Giken Kogyo Kabushiki, Kaisha, Tokyo, Japan

Filed Jan. 21, 1969, Ser. No. 792,367
Claims priority, application Japan, Jan. 20, 1968, 43/3,509
Int. Cl. G05d *13/10*
U.S. Cl. 137—56 9 Claims



A fluid pressure governor comprises a rotating shaft having a pressure chamber in communication with a pressure fluid source such as a pump, there being a movable control valve in the chamber to regulate the opening of a discharge outlet, thereby to control the pressure of the fluid in the chamber. A main centrifugal weight engages the valve and a subsidiary centrifugal weight is resiliently connected to the main weight and is limited in its angle of swing to a predetermined value by a stop member such that the effect of the two weights is initially applied to the valve until the subsidiary weight is restrained, after which only the additive centrifugal effect of the main weight is applied to the valve.

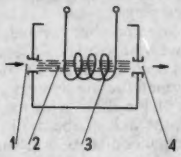
3,566,896

ELECTROPRESSURE JETSTREAM CONVERSION ELEMENT

Andrzej Proniewicz, 90 ul. Byslawska 79am 34, and Tadeusz Sinolecki, 84 ul. Nowogrod zka 10 m 10, Warsaw, Poland

Filed Feb. 5, 1968, Ser. No. 703,150
Claims priority, application Poland, Feb. 18, 1967, P-119039
Int. Cl. F15c *1/04*
U.S. Cl. 137—81.5 8 Claims

An electropressure fluid jetstream conversion element has an electric resistance heater of low thermal inertia in engagement with a jetstream inlet; a variation in an electric current supplied to the resistance heater, such as voltage or frequen-



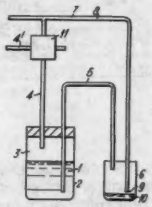
cy, causes a corresponding variation in a sensible property of the jetstream.

3,566,897

CONTROLLING THE FLOW OF FLUID COOLANT

David Thomas Collier, Dunstable, England, assignor to Hawker Siddeley Dynamics Limited, Hatfield, Hertfordshire, England

Filed May 6, 1969, Ser. No. 822,194
Claims priority, application Great Britain, May 9, 1968, 16,977/68
Int. Cl. F15c *1/04*
U.S. Cl. 137—81.5 7 Claims



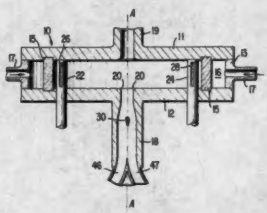
Apparatus for transferring a readily evaporable liquid, by gas pressure, from a first container to a second container, wherein a dip tube monitors the level of the liquid in the second container and the pressure signal in the dip tube is transmitted to a fluidic control device which controls the application of gas pressure to the liquid in the first container. The fluidic control device also receives a second control signal from the tube conveying the liquid from the first to the second container, and receives its main gas supply from the same source as that which supplies the gas pressure to the first container.

3,566,898

FLUERIC VORTEX PROPORTIONAL AMPLIFIER

Kenneth R. Scudder, Saint Leonard; John F. Burke, Beltsville, Md., and John L. Dunn, Fairfax, Va., assignors to the United States of America as represented by the Secretary of the Army

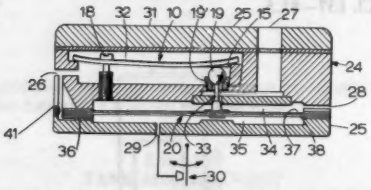
Filed Dec. 20, 1968, Ser. No. 785,544
Int. Cl. F15c *1/16*
U.S. Cl. 137—81.5 5 Claims



A flueric vortex proportional amplifier having two concentric rings contained between a top plate and a bottom plate

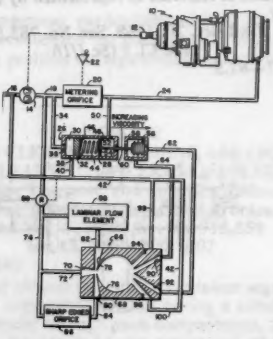
with fluid supply inputs providing a source of fluid between the concentric rings. The inner ring is of a porous material construction such that restricted fluid flow through the porous inner ring causes a nearly uniform pressure to be built up between the two rings to assure substantially irrotational radial flow within the chamber formed by the inner porous ring and the top and bottom plates. Concentric with the vortex chamber and in each end plate is a fluid output drain having an airfoil positioned therein and extending from the drain wall to the center of the drain with the chord of the airfoil being parallel with the axis of the drain. Downstream of the airfoil and in an expanded section of the drain, two normal splitters divide the drain into four equal outputs. The two outputs directly under the airfoil are the amplifier outputs. Two tangential control nozzles are positioned within the chamber with the output slots thereof facing in opposed tangential directions.

3,566,899
PNEUMATIC RELAY
Hoel L. Bowditch, Foxboro, Mass., assignor to The Foxboro Company, Foxboro, Mass.
Filed Jan. 7, 1969, Ser. No. 789,453
Int. Cl. F15b 5/00; G05d 16/00
U.S. Cl. 137—82 **3 Claims**



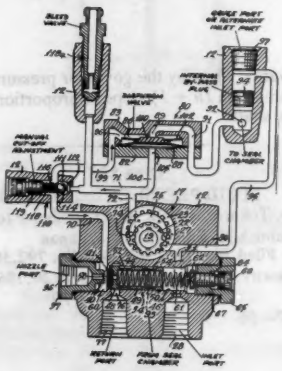
A pneumatic relay wherein a diaphragm is used as a valve actuator, with the diaphragm formed as a sandwich of a flexible metal sheet with relieving slots therethrough and a rubber sheet as a covering seal for the slots, and in which a leaf-spring structure is provided as an adjustable zero bias device for the relay valve, the spring being an H form with the H leg ends grounded and tongues between the H legs, one tongue having grounded adjustment means and another tongue as the spring force applicator to the relay valve as a bias therefor, this device, further, having an adjustable valve seat in the relay valve.

3,566,900
FUEL CONTROL SYSTEM AND VISCOSITY SENSOR USED THEREWITH
Jay I. Black, Orange, Conn., assignor to Avco Corporation, Stratford, Conn.
Filed Mar. 3, 1969, Ser. No. 803,758
Int. Cl. F15c 1/04
U.S. Cl. 137—83 **6 Claims**



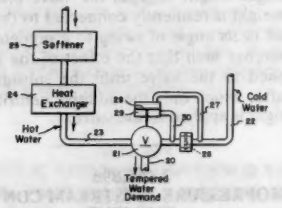
The disclosure illustrates a fuel viscosity sensor incorporated in a fuel control system for a gas turbine engine to assure a constant engine power output irrespective of fuel viscosity changes. The viscosity sensor comprises a proportional fluidic amplifier having a laminar flow element, series connected with one control jet. The fluidic amplifier is connected to the pressurized fuel supply and its output is proportional to the fuel viscosity. The pressure output from this amplifier is used to correct a flow-metering device for viscosity changes.

3,566,901
FUEL REGULATING VALVE
Nils E. Swedberg, Rockford, Ill., assignor to Sundstrand Corporation
Filed Feb. 27, 1969, Ser. No. 802,765
Int. Cl. G05d 7/01, 16/06
U.S. Cl. 187—87 **15 Claims**



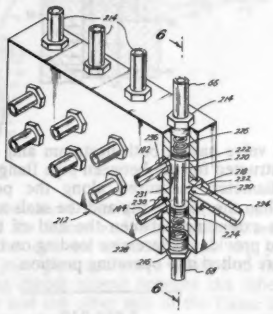
A fuel burner regulating valve assembly including a main regulating valve for controlling the supply of fuel to a burner nozzle and a flow responsive valve upstream of the main regulating valve for bypassing fluid from the main valve until a predetermined flow rate is achieved, together with a variable orifice for providing a pressure drop that controls the flow responsive valve, the variable orifice being located in the supply passage to the main regulating valve and automatically operative to change its effective area with flow rates above the predetermined flow rate to maintain a substantially constant pressure drop thereacross.

3,566,902
FLUID FLOW SYSTEM
John T. Muller, Nutley, N.J., assignor to Leslie Company, Lyndhurst, N.J.
Filed May 13, 1968, Ser. No. 728,580
Int. Cl. G05d 11/00
U.S. Cl. 137—100 **4 Claims**



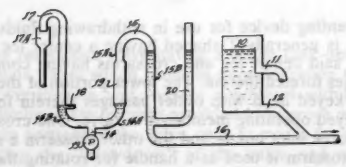
In a fluid flow system having at least two flow branches whose pressure drop variations with flow rate changes are different, a flexible orifice is placed in a branch with the lesser pressure drop. The pressure drop across this orifice, which expands with increasing flow rate, tends to balance the pressure drop in the other branch or branches so as to make possible predetermined control of the fluid flow in the system.

3,566,903
DUMP VALVE
Don R. Honeycutt, Bryan, Tex., assignor to Omark-Prentice Hydraulics, Inc., Portland, Oreg.
Original application May 18, 1967, Ser. No. 639,360, now abandoned. Divided and this application Apr. 24, 1969, Ser. No. 840,882
Int. Cl. F15b *13/04*
U.S. Cl. 137—106 4 Claims



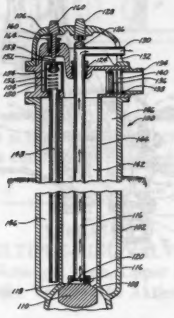
The present invention relates to hydraulic control systems, and in particular, to an improved dump valve to be used in such systems utilizing dump valves. The present invention discloses improved dump valves having a single spool and spool chamber with inlet and outlet openings at either end thereof and having a drain outlet intermediate the ends of the spool chamber. This single valve structure can be used for both hydraulic lines supplying actuating fluid to, and removing actuating fluid from, both sides of the piston in a cylinder operated by the remote control system.

3,566,904
LIQUID FLOW CONTROL SYSTEM
Harold S. Davis, Richland, Wash., assignor to the United States of America as represented by the United States Atomic Energy Commission
Filed Apr. 15, 1969, Ser. No. 816,236
Int. Cl. F17b *1/14*
U.S. Cl. 137—206 7 Claims



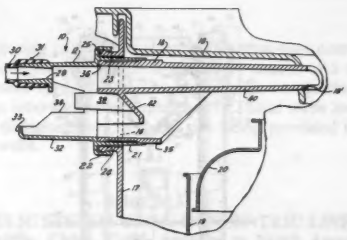
A liquid flow control system which provides for the instant and automatic substitution of an emergency supply of liquid for a normal supply of liquid when the normal supply is inadequate, while preventing the two liquids from mixing during normal operation. The two supplies of liquid are connected by an inverted U-tube extending above the highest level the normal supply can reach. An air pocket at the top of the inverted U-tube prevents mixing of the two liquids in normal operation. When the normal supply is exhausted, the air pocket is vented to the atmosphere, causing the emergency supply to flow through the U-tube supplementing the normal supply.

3,566,905
HYDRANT PURGING MEANS
Wayne B. Noland, Avon Lake, Iowa, assignor to Woodford Manufacturing Company, Des Moines, Iowa
Original application May 23, 1967, Ser. No. 640,676. Divided and this application Apr. 1, 1969, Ser. No. 812,043
Int. Cl. E03b *9/14*
U.S. Cl. 137—209 5 Claims



A hydrant having an inlet port and a discharge port with a fluid passageway therebetween, and an air compression chamber in communication with the fluid passageway wherein compressed air therein will purge the remaining fluid from the fluid passageway when the inlet port is closed.

3,566,906
WATER INLET FLUME
Robert B. Beare, Herrin, Ill., assignor to The Fedders Corporation, Edison, N.J.
Filed July 15, 1969, Ser. No. 841,789
Int. Cl. E03c *1/10*
U.S. Cl. 137—216 14 Claims

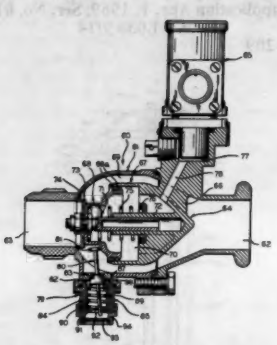


A water inlet flume assembly adapted for use in a household washing machine. The assembly comprises a first member having a tubular section at one end which is adapted to be positioned through an aperture in the tub of the washer. The opposite outer end of the first member includes an inlet nozzle and an underlying overflow trough. The second member is positioned on the inside of the tub and includes an upper trough in alignment with, but spaced from, the inlet nozzle. A transverse flange depends from the upper trough and is designed to skim the suds from the water in the event that the tub overflows and the water passes through the assembly in the reverse direction.

3,566,907
INLINE VALVE POSITION INDICATOR
Malcolm A. Sime, Des Plaines, and Carl E. Rudolph, Chicago, Ill., assignors to Vapor Corporation, Chicago, Ill.
Filed Apr. 25, 1969, Ser. No. 819,365
Int. Cl. F16k *37/00*
U.S. Cl. 137—219 6 Claims

Inline valve position indicator, wherein the valve includes a poppet assembly having a piston and valve closure member

driven pneumatically into open position and mechanically into closed position, wherein the position indicator includes a lever extending through the valve body and mounted thereon

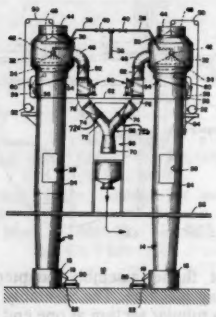


in pivotal and sealing relation and responsive to the movement of the piston and valve closure member, and wherein the motion of the lever is transmitted externally to actuate a readout means.

3,566,908
GASTIGHT, LIQUID SEALED, SWING-TYPE VALVE ASSEMBLY

Edward M. Macnak, Des Plaines, Ill., assignor to National Dust Collector Corporation, Skokie, Ill.

Filed June 16, 1969, Ser. No. 833,560
Int. Cl. F16k *9/00*
U.S. Cl. 137—248 **6 Claims**

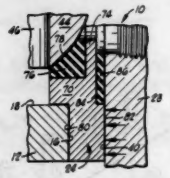


A gastight, liquid sealed, swing-type valve construction for controlling the flow of gases through a conduit comprising a housing having sidewalls and open at the upper and lower ends for connection with the conduit, a swing valve mounted for pivotal movement about a horizontal axis adjacent one end of the housing between a conduit closing shutoff position and an open position substantially out of the flow path of gas through said housing. Annular trough means is provided on the upper side of the swing valve so that when the valve is in said closed position said trough means may hold a body of sealing liquid around the perimeter of the valve and thereby establish a gastight liquid seal around the interior of the housing wall. Annular curtain wall means around the inside of the housing wall extends inwardly and downwardly of the sidewalls into the liquid in the trough means forming said liquid seal when the swing valve is in said closed position.

3,566,909
BETWEEN FLANGE BALL VALVES WITH FIXED-UNSTRESSED SEALS

Domer Scaramucci, Oklahoma City, Okla., assignor to Balon Corporation, Oklahoma City, Okla.

Filed Jan. 3, 1966, Ser. No. 518,244
U.S. Cl. 137—315 **4 Claims**

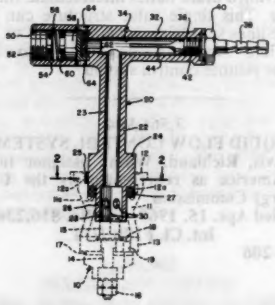


A ball valve having both upstream and downstream seals and constructed for use between pipe flanges. The valve ball has a diameter, measured along the port therethrough, greater than the valve body and the seals are carried by seat members extending between the end of the body and the flanges to provide compressive loading on the body when the flanges are bolted into operating position.

3,566,910
VENTING DEVICE

R. Ellsworth Doremus, Clifton, and Richard E. Doremus, Morristown, N.J., assignors to Golden Gate Manufacturing Company, Delawanna, N.J.

Filed Nov. 19, 1968, Ser. No. 777,072
Int. Cl. F16k *17/168*
U.S. Cl. 137—323 **6 Claims**



A venting device for use in withdrawing fluids from kegs which is generally T-shaped having a center leg and crossarms, said center leg and crossarms having communicating passages formed therein. The lower portion of the center leg has a keyed head with outlet passages therein for engaging the keyed operating member of a valve. One crossarm has a gas source inlet nozzle and the other crossarm a safety vent. The crossarm is used as a handle for rotating the device to open and close the valve.

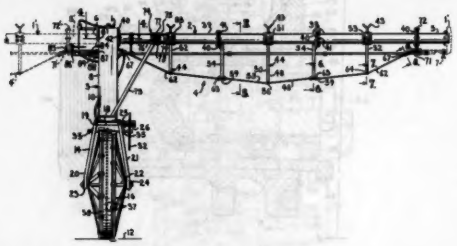
3,566,911
MOBILE UNIT FOR SELF-PROPELLED IRRIGATION SYSTEMS

Benjamin R. Neier, East Wyatt Earp and Highway 50, Dodge City, Kans.

Filed Apr. 14, 1969, Ser. No. 815,659
Int. Cl. B05b *9/02*; E01h *3/02*
U.S. Cl. 137—344 **7 Claims**

A mobile unit for self-propelled irrigation systems having a plurality of mobile units wherein each mobile unit has an elongate frame, a yoke mounted on each end of the frame, a wheel rotatably mounted on each of the yokes, an elongate

irrigation pipe has one end mounted on and extends transversely from one side of the frame, truss members supporting the irrigation pipe, and drive means operatively connected thereto for driving the mobile unit. The mobile units in the irrigation system are adapted to move relative to each other by a slip or expansion joint having one end of a slip joint pipe received in one end of a sleeve member mounted in the frame and one end of the irrigation pipe communicating with



the other end of the sleeve member. A collar is mounted on the other side of the frame and has fluidtight seal means therein engaging an exterior surface of the slip joint pipe whereby the slip joint pipe can move relative to the frame. Movement limiting means extend between the other end of the slip joint pipe and the other side of the frame for maintaining the one end of the slip joint pipe within the sleeve member.

3,566,912

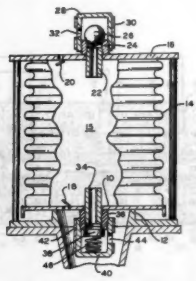
MAGNETICALLY BIASED VALVE DEVICE

Evald Dunkelis, Glenn Ellyn, Ill., assignor to GPE Controls, Inc., Morton Grove, Ill.

Continuation-in-part of application Ser. No. 625,758, Mar. 24, 1967, now Patent No. 3,454,040. This application Sept. 16, 1968, Ser. No. 760,020

Int. Cl. F16k *17/10, 17/19*

U.S. Cl. 137—493 **10 Claims**



A pressure responsive valve having a single tank opening and single main pallet which provides pilot operation to relieve both overpressure and vacuum conditions within the tank. Also disclosed are features provided to improve operation of certain portions of the valve, such as means for selectively adjusting the "blowdown" of the valve and means providing a predetermined flux gap as well as improved sealing and antisticking qualities in a valve having permanent magnet biasing means.

3,566,913

DIAPHRAGM VALVE

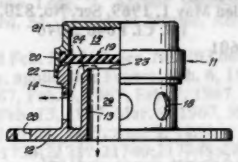
Arthur C. Parthe, Jr., Peabody, Mass., assignor to the United States of America as represented by the Secretary of the Navy

Filed Nov. 14, 1968, Ser. No. 775,869

Int. Cl. F16k *17/18*

U.S. Cl. 137—493 **3 Claims**

An elastic diaphragm valve is provided which permits control of fluid flow by a small pressure gradient. The diaphragm is disposed opposite a pair of passages connecting two flow lines and is under selected pressure so that, when the pressure in each of the flow lines is equal to or greater than the



selected pressure, flow will occur; and when the pressure in one of the flow lines is less than the selected pressure and in the other flow line is equal to the selected pressure, flow will be prevented.

3,566,914

MULTIPLE-RING VALVE

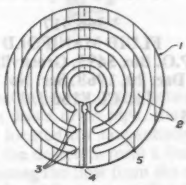
Robert F. Koehler, Schonga, Lech, Upper Bavaria, Germany, assignor to Hoerbiger Ventilwerke Aktiengesellschaft, Vienna, Austria

Filed May 21, 1968, Ser. No. 730,875

Claims priority, application Austria, May 30, 1967, A5049/67

Int. Cl. F16k *15/14*; **F04b** *39/00*

U.S. Cl. 137—516.13 **1 Claim**



A multiple-ring valve, particularly for piston-type compressors, the valve plate of which is loaded by means of a cylindrically arcuate spring plate. The spring plate comprises concentric rings interconnected by means of radial webs located on a single diameter only, a radial slot being provided in the area of the webs.

3,566,915

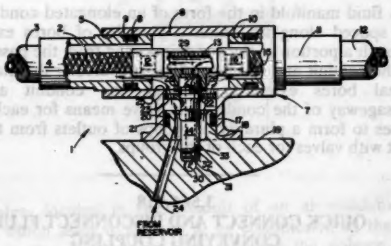
HYDRAULIC SYSTEM USING CONCENTRIC LINES

Willis D. Griffin, Chino, Calif., assignor to North American Rockwell Corporation

Filed May 5, 1969, Ser. No. 821,568

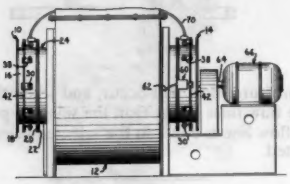
Int. Cl. F16l *39/00*

U.S. Cl. 137—561 **2 Claims**



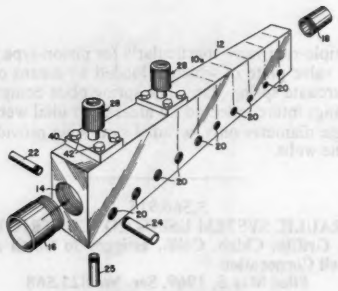
The pressure hose of a hydraulic system is enclosed within the return hose and connected by a hydraulic fitting to the mechanical system being operated by the hydraulic fluid passing through the hoses.

3,566,916
INLET VANE DAMPER
James R. Root, Independence, Mo., assignor to Ruskin Manufacturing Company, Grandview, Mo.
Filed May 1, 1969, Ser. No. 820,727
Int. Cl. F04d 29/46
U.S. Cl. 137—601 6 Claims



An inlet vane damper having a rigid ring interconnecting the vane shafts for closing or opening the vanes simultaneously. A crank arm of spring material interconnects each shaft with the ring to tolerate minor variations in the movement of the various arms with respect to the ring to obviate the necessity for precision in the manufacture and assembly of the damper control elements.

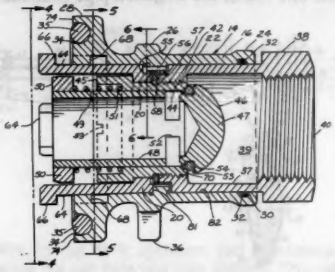
3,566,917
FLUID MANIFOLD
James C. White, P.O. Box 5495, Greenville, S.C.
Filed Dec. 20, 1968, Ser. No. 785,608
Int. Cl. F16d 1/00
U.S. Cl. 137—608 5 Claims



A fluid manifold in the form of an elongated conduit having spaced along its length a plurality of bores extending through a portion of the conduit spaced from the passageway of the conduit and substantially perpendicular thereto. Additional bores extending through the conduit and the passageway of the conduit and valve means for each of the bores to form a plurality of groups of outlets from the conduit with valves for each of the groups.

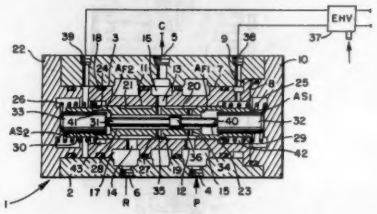
3,566,918
QUICK CONNECT AND DISCONNECT FLUID CONVEYING COUPLING
John T. Rauen, Detroit, Mich.
Filed Aug. 6, 1969, Ser. No. 847,872
Int. Cl. F16l 37/24
U.S. Cl. 137—614.04 5 Claims

A fluid conveying connection coupling comprising two identical couplings which, when connected to the end of two fluid conveying flexible lines, can be leaklessly attached to each other to join the lines and simultaneously therewith,



permit flow of fluid therein and self-sealingly interrupt the flow upon disconnecting the couplings.

3,566,919
HYDRAULIC SERVO VALVE WITH PRESSURE FEEDBACK
Robert Dale Vanderlaan, Kalamazoo, Mich., assignor to Pneumo Dynamics Corporation, Cleveland, Ohio
Filed Jan. 24, 1969, Ser. No. 793,690
Int. Cl. F16k 11/07
U.S. Cl. 137—625.63 12 Claims

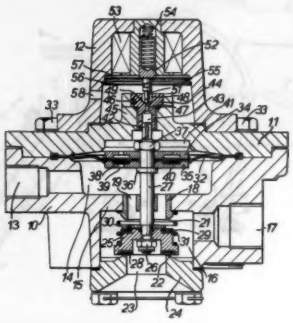


A servovalve including a hollow valve spool containing a multipiece plunger-piston stack defining separate first stage and feedback pressure areas for the spool. The plunger-piston stack extends the entire length of the bore in which the spool is contained to provide a central load reaction path therefor.

3,566,920
FLUID CONTROL VALVES
Charles G. Stewart, Solihull, England, assignor to Girling Limited, Birmingham, England
Filed Jan. 16, 1969, Ser. No. 791,602
Claims priority, application Great Britain, Jan. 24, 1968, 3,704
Int. Cl. F16k 11/02
U.S. Cl. 137—625.64 7 Claims

In a fluid control valve in which a double-beat valve head is adapted to engage alternatively with opposed axially spaced valve seats located respectively between inlet and

outlet ports in the valve body and between the outlet port and a further port, the position of the valve head is controlled by a diaphragm which is exposed on its underside to the inlet pressure and on its upper side to the pressure in a



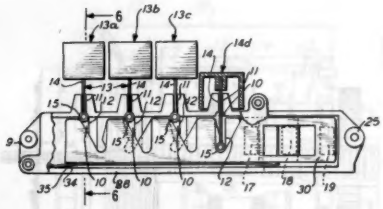
chamber which is connected to atmosphere through a passage in the valve body coaxial with the valve on energization of a solenoid actuating a pilot valve which normally closes the passage.

3,566,921

MULTIPLE INTERLOCKED VALVE CONSTRUCTION

Frederick C. Bell, Newburytort, and Clifford R. Walker, Peabody, Mass., assignors to Proctor-Silex Incorporated, Philadelphia, Pa.

Filed May 22, 1969, Ser. No. 827,003
Int. Cl. F16k *11/22*
U.S. Cl. 137—637.1 **7 Claims**



A bleeder valve for vacuum cleaners comprises a housing including a body portion having three longitudinally spaced ports laterally venting, and a stem portion having three longitudinally slidable laterally spaced vanes therein adapted to seal respective ones of said ports. Each of the sliding vanes includes four cutout portions, certain of the perimeters of which being predetermined camming type surfaces and respective ones of which being in lateral alignment to constitute four sets of three laterally aligned cutout portions. The stem portion further has four transverse bores each opening at the top of the stem portion to receive a reciprocative plunger therein, each plunger being of a sufficient lateral dimension to be received in each of the laterally aligned cutout portions of each respective set, each set being coincident with a respective bore. The camming type surfaces of the cutout portions are designed so that only one plunger may be in actuated position at any one time, and, by actuation of any of the four plungers, a predetermined, selective opening or closing of the three ports by their respective vanes may be accomplished for negative pressure control in the vacuum cleaner.

3,566,922

METHOD AND DEVICE CONNECTING DOWN DRAIN PIPES FOR PRODUCING A VENTILATING GYROLAMINAR FLOW

Monique nee Jouve Legg, 3, Avenue Anatole France, and Georges Richard, 51, Avenue St-Jerome, Aix-En-Provence, France

Filed Feb. 5, 1968, Ser. No. 703,069
Claims priority, application France, Feb. 6, 1967, Feb. 6, 1967, Feb. 6, 1967, Feb. 6, 1967, Feb. 7, 1967, Feb. 8, 1967, Feb. 13, 1967, Feb. 13, 1967, Mar. 9, 1967, Mar. 9, 1967, July 28, 1967, Aug. 9, 1967, 21737;21738;21739;21740;217745;217746 ;21755;21756;21779;21780;21931;21945
Int. Cl. F15d *1/02*
U.S. Cl. 138—39 **4 Claims**

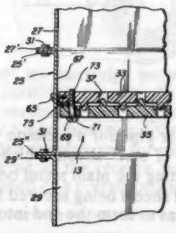
The branching pipe device mounted between an upper and a lower portion of a down drain pipe, the said device comprising a main inlet located for tangentially projecting fluid on the inside wall of the device to form a fluid curtain, secondary inlets for preventing the flow from the main inlet to flow upwardly, inclined planes for regenerating the movement of the fluid and cutting the fluid curtain to maintain the intercommunication between the atmospheric pressure of the air inside the device and the air from the secondary inlets.

3,566,923

AIR VOLUME AND PRESSURE REDUCING MEANS IN AN AIR CONDITIONING MEANS

Gilbert H. Avery, 4542 Aldersgate Road, Memphis, Tenn.

Filed Dec. 13, 1967, Ser. No. 690,174
Int. Cl. F15d *1/10;* **F16l** *55/00*
U.S. Cl. 138—43 **11 Claims**



A valve, located in the conduit of an air-conditioning system which leads to a room to be conditioned by the air, for dissipating the velocity and reducing the volume and pressure of the air entering the room. The valve includes an upper plate and a lower plate spaced in parallel relationship below the upper plate. The plates are provided with a multiplicity of small apertures, the apertures of the lower plate being laterally offset from those of the upper plate. Each of

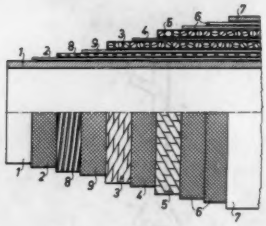
the plates are provided with smooth parabolic shaped protrusions which coact with the apertures in the other plate. A mechanism is provided for moving one of the plates relative to the other of the plates to valve the flow of air therethrough.

3,566,924

PRESSURE-RESISTANT FIBER REINFORCED HOSE

Sandor Ambrus, and Katalin Teleki, Budapest, Hungary, assignors to Orszagos Gumiipari Vallalat, Budapest, Hungary

Filed Jan. 2, 1969, Ser. No. 788,508
Claims priority, application Hungary, Jan. 9, 1968, AU-189
Int. Cl. F16l *11/08*
U.S. Cl. 138—130 5 Claims



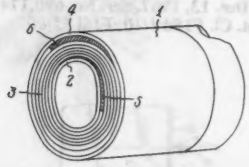
A pressure-resistant hose, particularly for deep drilling, comprises spaced oppositely helically wound reinforcing inserts whose pitch, measured from a plane perpendicular to the axis of the hose, increases radially outwardly from insert to insert, for example, 6'—5° for the innermost, 25—32° for the next, and 38—45° for the next outer layer.

3,566,925

SPIRAL MULTILAYER PIPE FOR PRESSURE VESSEL

Hideo Sagara; Tomoyuki Mashimo, and Takeshi Kifune, Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Toyko, Japan

Filed Feb. 12, 1969, Ser. No. 798,679
Int. Cl. F16l *9/14*
U.S. Cl. 138—143 4 Claims



A spiral multilayer pipe for a pressure vessel characterized in that a plurality of steel sheets which are thinner than a hoop steel constituting the main spiral body and are different in length, said steel sheets being secured to at least one of the hoop steel ends so as to form the end into wedged shape.

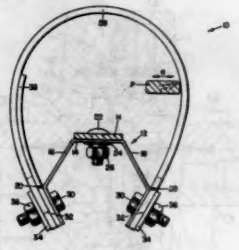
3,566,926

PICKER STICK CHECK

Walter Roy Hampson, Holyoke, Mass., assignor to Clinton Silk Mill, Inc., Holyoke, Mass.

Filed Apr. 1, 1969, Ser. No. 812,071
Int. Cl. D03d *49/40*
U.S. Cl. 139—165 2 Claims

A loom picker stick check comprising, a bracket adapted for attachment to the lay of a loom, the bracket being substantially U-shaped and having a pair of legs, a check strap adjustably secured at its opposite ends to a respective one of



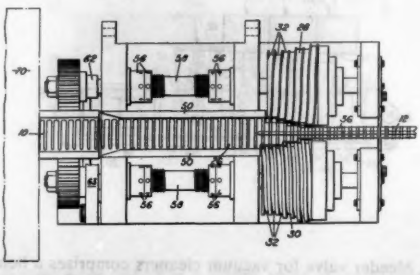
the legs of the bracket, the check strap forming a loop extending outwardly from the bracket for confining and substantially surrounding the picker stick.

3,566,927

BOOKBINDING

Sidney George William Adams, Hersham, England, assignor to James Burn & Co. Ltd., Surrey, England

Filed Dec. 6, 1968, Ser. No. 781,722
Claims priority, application Great Britain, Dec. 15, 1967, 57161/67
Int. Cl. B21f *45/00*
U.S. Cl. 140—71 13 Claims



A method for the conversion of strips of zigzag wire into a tubular form suitable for binding perforated sheets, comprising feeding the strip over an anvil in a step-by-step fashion, and clamping the strip whilst it is stationary so that the edges can be bent over the anvil by strikers situated on either side of the anvil.

3,566,928

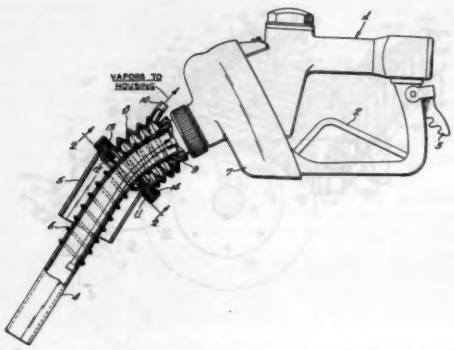
VAPOR SEAL FOR DISPENSING NOZZLES

William B. Hansel, Media, Pa., assignor to Sun Oil Company, Philadelphia, Pa.

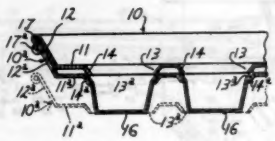
Filed July 22, 1969, Ser. No. 843,719
Int. Cl. B65b *1/28, 3/18;* B67c *3/02*
U.S. Cl. 141—97 4 Claims

Vapors displaced from a liquid fuel tank by the liquid fuel

being dispensed thereinto through a nozzle are collected by means of a flexible bellows which surrounds the nozzle and one end of which is sealed to the fillpipe of the fuel tank.



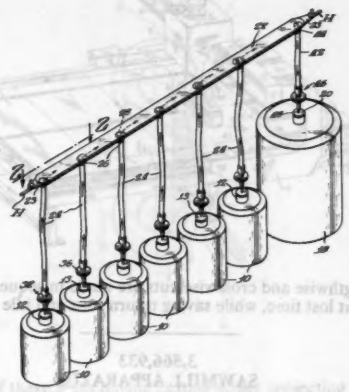
3,566,929
CUP FILLING APPARATUS
Gerald M. Mead, Rte. 3, Cullman, Ala.
Filed Aug. 1, 1968, Ser. No. 749,520
Int. Cl. B65b *3/04*
U.S. Cl. 141—237 2 Claims



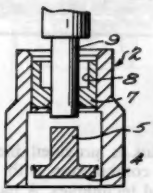
Cup-filling apparatus embodying a tray having a flat bottom wall and upstanding sidewalls. A plurality of spaced apart openings in the bottom wall are surrounded by downwardly and inwardly extending continuous flanges which engage upper inner surfaces of subjacent cuplike members to define a continuous seal therewith. A second tray having openings therein and downwardly and inwardly extending flanges in vertical alignment with the openings and flanges in the first-mentioned tray is mounted beneath the first mentioned tray with upper edges of the cuplike members clamped therebetween.

3,566,930
MEANS FOR STERILELY TRANSFERRING BLOOD PLASMA, SERUM, BIOLOGICAL OR PHARMACEUTICAL FLUIDS, AND THE LIKE
Leon I. Kirschner, Skokie, Ill., assignor to K-N Enterprises, Inc., Skokie, Ill.
Filed May 2, 1968, Ser. No. 726,065
Int. Cl. B65b *37/00*
U.S. Cl. 141—244 2 Claims

Means for sterilely transferring blood plasma, serum, biological or pharmaceutical fluids and the like from a plurality of containers containing said plasma or fluids to a single collecting or pooling container, or conversely transferring same from a single container to a plurality of containers, said means comprising a manifold provided with a plurality of conduits or tubes, each of which is connected to a separate container of a plurality of containers, and a conduit or tube which is connected to the pooling or larger container.



3,566,931
INK CARTRIDGES OF SYNTHETIC MATERIAL
Franco Verona, Turin, Italy, assignor to Aurora Societa per Azioni, Turin, Italy
Filed Oct. 8, 1968, Ser. No. 765,898
Claims priority, application Italy, Oct. 11, 1967, 53314-A/67
Int. Cl. B65b *1/04, 3/00*
U.S. Cl. 141—367 2 Claims

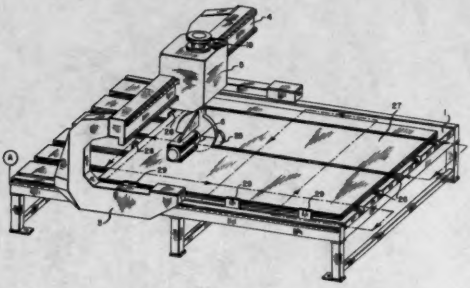


An adapter for an ink cartridge including a closure for fountain pens with cartridge openers. The adapter having a plurality of surface means thereon respectively dimensioned and configurated for accommodating differently dimensioned fountain pen cartridge openers and for permitting displacing force to be transmitted to the closure from a fountain pen cartridge opener of each of a corresponding plurality of sizes.

3,566,932
PROCESS FOR RATIONAL PRODUCTION OF SIZE PLATES WITH A PLATE SAW, IN PARTICULAR USING AN ELECTRONIC CONTROL AND DEVICE FOR PRACTICING SAID PROCESS
Guenther Papenmeier, Schulstrasse 4931 Pivetsheide V.L. Kreis, Detmold, Germany
Filed Apr. 4, 1968, Ser. No. 718,706
Int. Cl. B27b *5/18*; B23d *45/02*
U.S. Cl. 143—47 5 Claims

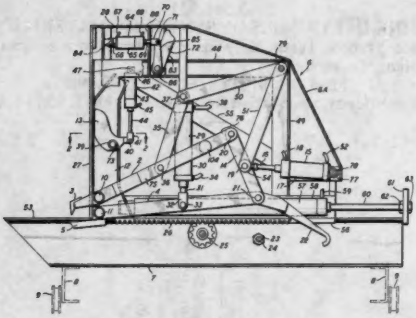
The invention relates to a sawing machine for rational

production of size plates of any dimensions by means of a plate saw, wherein, after preselection of dimensions, a series



of lengthwise and crosswise cuts are made in sequential order without lost time, while saving return runs and idle cuts.

3,566,933
SAWMILL APPARATUS
Harold A. Pryor, c/o Mill Master Machine Works, Woodville, Tex.
Filed May 14, 1968, Ser. No. 729,050
Int. Cl. B27b *29/10*
U.S. Cl. 143—125 **20 Claims**

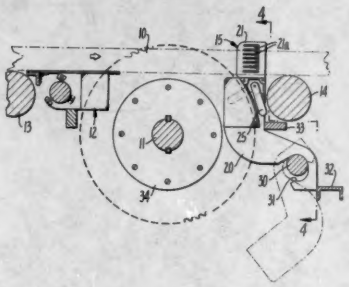


Sawmill apparatus is provided including automatic log-turning means in combination with improved nondefacing gripping means and techniques. A pair of gripping arms are pivotally mounted at opposite ends of an equalizer bar, whereby the gripping arms may be selectively and individually manipulated for gripping the top and bottom surfaces of a saw log or cant in a manner to avoid defacing the backing board. A bumper arm is also provided and utilized in cooperation with the lower gripping arm to rotate the saw log.

3,566,934
SAW GUIDED SPLITTER
Elbridge W. Thrasher, Ukiah, Calif., assignor to Masonite Corporation
Filed Oct. 28, 1968, Ser. No. 770,937
Int. Cl. B27b *5/28*
U.S. Cl. 143—167 **10 Claims**

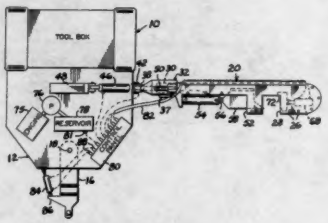
In combination with a saw machine having a relatively thin circular saw mounted upon an arbor with floating axial looseness and a saw guide defining a limiting control plane for guiding the leading edge of said saw, a splitter mounted for lateral movement and laterally positioned by the rear edge of said saw.

A splitter for use in saw machines having a circular saw and comprising a pair of spaced contacts, each contact having a bearing surface for making contact with opposite sides



of a circular saw, and a divider member having a plurality of resilient contacts that extend into a region above said spaced contacts and in trailing relation to the rear edge of a saw.

3,566,935
TREE FELLING AND CUTTING APPARATUS
Keldon W. Wilds, 1440 N.W. 49, Oklahoma City, Okla.
Filed Aug. 16, 1968, Ser. No. 753,219
Int. Cl. A01g *23/02*
U.S. Cl. 144—34 **5 Claims**

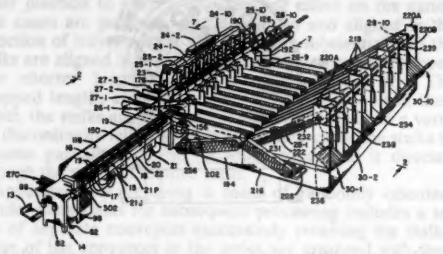


A two-wheel trailer frame is provided with a laterally extending arm structure having a tree bowl receiving socket. Oppositely disposed blades are movable toward and away from each other across the socket. Hydraulic power supply means is mounted on the trailer and arm structure for raising and lowering the arm and reciprocating the blades.

3,566,936
LUMBER SORTING METHOD
Alexander J. Golick, Seattle, Wash., and Ernest D. Giuseponi, Stockton, and Arthur J. Randolph, Santa Rosa, Calif.; said Giuseponi and said Randolph assignor to said Golick
Original application Dec. 22, 1965, Ser. No. 515,697, now Patent No. 3,502,123, dated Mar. 24, 1970. Divided and this application Aug. 18, 1969, Ser. No. 850,911
Int. Cl. B27b *1/00*
U.S. Cl. 144—312 **10 Claims**

A lumber cutting and sorting method wherein the lumber is cut into various predetermined lengths by abutting them

against gage stops while making the cut. The gage stops have associated sensing means controlling downstream lateral



deflector means for sorting the lumber by thickness, width, and/or grade. Crossed plural conveyors remove the cut lumber after sorting.

3,566,937

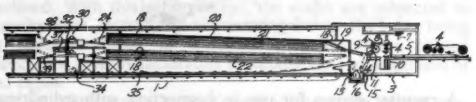
INLINE VENEER PRODUCTION SYSTEM

Harold E. Erickson, Federal Way, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Original application Oct. 10, 1963, Ser. No. 315,248, now Patent No. 3,280,866, dated Oct. 25, 1966. Divided and this application Apr. 6, 1966, Ser. No. 540,796

Int. Cl. B27l *5/02*

U.S. Cl. 144—327 **9 Claims**



A system for efficiently utilizing a wood veneer peeling lathe and dryer by installing a number of horizontally disposed and vertically spaced veneer storage and conveying trays spanning from the peeling lathe to the dryer. More levels of trays are provided than levels of conveyors in the dryer to insure a ready source of veneer to keep the dryer supplied with no gaps between pieces of veneer. A waste removal clipper may be positioned between the ends of the trays for removal of defective portions of veneer. The wetter portions of veneer can be conveyed to a slower dryer conveyor while the drier portions can be conveyed on a faster dryer conveyor without overdrying.

3,566,938

CHAIN CUTTER FOR DEBRANCHING AND DEBARKING TREES

Georg Wehr, and Gotthold Gotze, Rotenburg an der Fulda, Germany, assignors to Rotenburger Metallwerke GmbH, Fulda, Germany

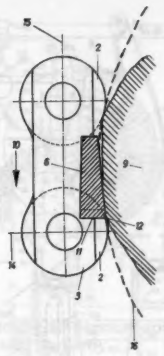
Filed Mar. 6, 1967, Ser. No. 620,925

Claims priority, application Germany, Mar. 9, 1966, R42786

Int. Cl. B27l *1/00;* **B27b** *33/14*

U.S. Cl. 144—208 **10 Claims**

A chain cutter for debarking and debranching tree trunks and having a plurality of roller members which engage the trunks and which are connected together with a plurality of links to form a link chain. A plurality of cutting teeth are fixed to the outer links of one side face of said chain, one



portion of these teeth having cutting edges projecting beyond their associated link towards the trunk, and terminating approximately at a point which is on a line with the points of engagement of an associated roller and the trunk.

3,566,939

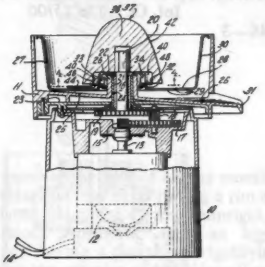
FRUIT JUICE EXTRACTORS

Frederick M. Hubrich, Winsted, Conn., assignor to Ronson Corporation, Woodbridge, N.J.

Filed Feb. 10, 1969, Ser. No. 797,740

Int. Cl. A47j *19/00;* **A23n** *1/02*

U.S. Cl. 146—3 **7 Claims**



A wiper is removably coupled to the reamer of a fruit juice extractor for rotation therewith, the reamer and/or wiper having means thereon for selectively adjusting the height of the wiper above the surface of the juicer strainer. The pulp content of the juicer varies in accordance with the height of the wiper above the surface of the juicer strainer.

3,566,940

APPARATUS FOR SECTIONIZING CITRUS FRUIT

Robert S. Shrewsbury, Dunedin; John D. Webb, Clearwater, Fla., and Ronald C. Bushman, Claremont, Calif., assignors to Brown International Corporation, Covina, Calif.

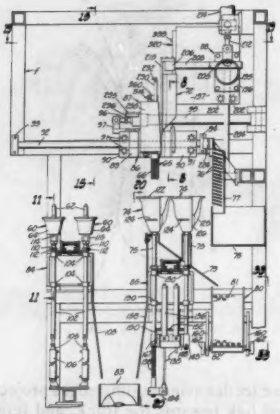
Filed Jan. 11, 1968, Ser. No. 697,215

Int. Cl. A23n *15/00*

U.S. Cl. 146—3 **48 Claims**

With a plurality of sectionizing tools partially inserted into a corresponding plurality of citrus fruit that are impaled on corresponding holders, the holders rotate until the tools laterally impinge on radial membranes of the respective fruit

and then the tools make sectionizing strokes. In the meantime a new plurality of fruit is being loaded manually on corresponding loading spikes that are adapted to transfer the new plurality of fruit to the respective holders.

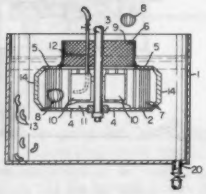


3,566,941

METHOD AND APPARATUS FOR SEPARATING SEGMENTS OF ORANGES

Yonekichi Morikawa, Shimizu, Japan, assignor to Daiwa Can Co. Ltd., Tokyo, Japan

Filed Aug. 21, 1968, Ser. No. 754,238
Claims priority, application Japan, Jan. 24, 1968, 43/3700
Int. Cl. A23n *15/00*
U.S. Cl. 146—3 **4 Claims**



The disclosed apparatus separating the segments of oranges automatically separates the segments of fruits such as oranges, continuously throwing the peeled oranges and separating them into independent segments.

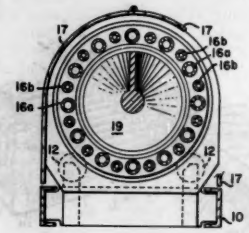
3,566,942

APPARATUS FOR PEELING VEGETABLES OR FRUITS

Traver J. Smith, San Jose, Calif., assignor to Genevieve I. Hanscom, Saratoga, Calif.; Genevieve I. Magnuson; Robert Magnuson and Los J. Thomson, trustees of the Estate of Roy M. Magnuson, a fractional part interest to each

Filed Aug. 2, 1968, Ser. No. 749,832
Int. Cl. A23n *7/02*
U.S. Cl. 146—49 **3 Claims**

This invention provides a peeling cylinder whose peripheral wall is made up of abrasive peeling rolls and through the center of which a feed screw extends to progress material through for peeling. The rolls are all rotated at the same r.p.m. in speed but certain rolls are of smaller diameter to provide longitudinally extending recesses or pockets to provide both a lifting action on the material being peeled to increase the effective peeling time on this material, and also to provide a differential speed between adjacent rolls of different diameter so as to further enhance the peeling action.

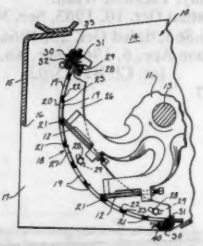


3,566,943

RECUTTER SCREEN

Wilmer E. Witt, Appleton, Wis., assignor to Koehring Company, Milwaukee, Wis.

Filed Aug. 5, 1968, Ser. No. 750,033
Int. Cl. B02c *18/00*
U.S. Cl. 146—117 **3 Claims**



A recutter screen for use in connection with cylindrical cutters having rectangular openings separated by bars, those bars which extend axially of the cutter having inwardly offset edges to provide shearing knives for coaction with the blades of the cutter, the screen being adjustably mounted against adjustable crescents on the end walls of the cutter frame and being readily reversible to present an alternate set of shearing edges when one set becomes worn.

3,566,944

METHOD FOR PREPARING SUGARCANE STALKS FOR SUBSEQUENT PROCESSING

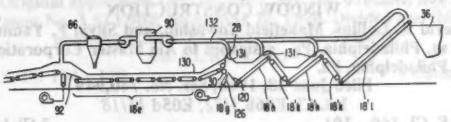
Sydney E. Tilby, Winterburn, Alberta, Canada, assignor to Canadian Cane Equipment, Ltd., Montreal, Quebec, Canada

Filed Dec. 20, 1967, Ser. No. 692,237
Int. Cl. B07 *4/08*; B26d *7/00*
U.S. Cl. 146—222 **10 Claims**

A method for preparing a mass of randomly oriented, slender cane stalks for subsequent processing at a selected location. The method is intended to deliver the stalks in cleaned condition, chopped into uniform, relatively shorter lengths and aligned longitudinally in their direction of motion. The method includes delivering the mass of stalks to a series of successively, more rapidly moving, conveyor means and subjecting the stalks to sudden vertical deflections at some of various junctions between adjacent ones of the conveyor means. At some of the junctions heavy debris (such as rocks) mixed with the stalks is caused to gravitate rearwardly and downwardly between adjacent ones of the conveyor means. At least one junction, leading portions of the stalks in

the mass are also subjected to a force in a downstream direction aligned with their direction of travel upstream of the one junction. At another junction concurrently with vertical motion the canes are also subjected to a force in a direction downstream of the other junction, inclined transversely to direction of travel of the canes upstream of the other junction to exert a disentangling effect on the canes. The canes are progressively thinned out and aligned in the direction of travel and, at a point where substantially all the stalks are aligned in the direction of travel, they are chopped into shorter lengths while moving longitudinally. The chopped lengths are then realigned. At some point in their travel, the stalks are projected at high velocity across a vertical discontinuity in the conveyor means to cause the stalks to become partially airborne, at which time fluid is directed through the stalks to remove trash.

Apparatus for preparing a mass of randomly oriented, slender cane stalks for subsequent processing includes a series of separate conveyors successively receiving the stalks. Some of the conveyors in the series are arranged with their downstream ends spaced vertically above and overlapping the upstream ends of the next succeeding conveyors to define cascading junctions, between adjacent conveyors at which a vertical deflection is imparted to the stalks.



At least one pair of successively related, cascading conveyors have their respective directions of travel aligned and another pair of successively related, cascading conveyors have their respective directions of travel transversely inclined. With this arrangement, the stalks are subjected to simultaneous vertical and accelerating forces, the latter being at separate times in different perpendicularly related directions, thereby facilitating disentangling and alignment of the canes.

A chopping means is positioned adjacent one of the conveyor means positioned sufficiently downstream, at a point where almost all of the canes are travelling longitudinally. The chopping means cuts the stalks transversely thereof into uniform shorter lengths, while they are moving longitudinally. Realigning means positioned adjacent the chopping means realign the chopped lengths of stalk in parallel relation.

At some point in their travel, the conveyor means project the stalks at sufficiently high velocity across a transversely extending, vertical discontinuity in the series of conveyor means to cause the stalks to become at least partially airborne during which time fluid-directing means directs fluid through the stalks to remove trash.

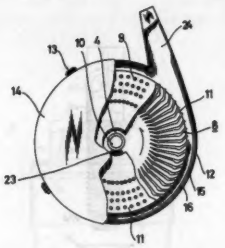
3,566,945

METHOD OF HULLING PADDY AND DEVICE THEREFOR

Yutaka Aoki, Tokyo, Japan, assignor to Sanriku Noki Co., Ltd.

Filed July 9, 1968, Ser. No. 743,565
Claims priority, application Japan, July 13, 1967, 42-45203/67
Int. Cl. B02c *13/28, 13/08*
U.S. Cl. 146—223 **6 Claims**

A method of hulling paddy which comprises revolving numerous hulling vanes having outer bent ends to produce a lower atmospheric pressure zone which is virtually the same as the vacuum state, passing paddy through the said lower pressure zone to expand the gas in paddy abruptly thereby rendering paddy to the state just before the crack and immediately thereafter throwing paddy against outer bent ends of the hulling vanes to crack the hulls and then discharging



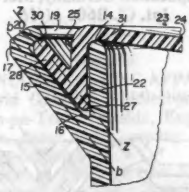
the cracked paddy into the air pressure zone so that hulls and husked rice are separated perfectly.

3,566,946

Y-FLANGED CONTAINERS AND COVER MEMBERS THEREFOR

James Ian Mac Donald, 708 7th Ave.S.W., Calgary, Alberta, Canada

Filed Dec. 26, 1968, Ser. No. 787,050
Claims priority, application Canada, Aug. 9, 1968, 027,206
Int. Cl. B65d *11/06, 11/26, 43/10*
U.S. Cl. 150—0.5 **13 Claims**



A closing cover member is provided for the mouth opening of an open-ended vessel such as a pail having a rim and made of a structural plastic material having nonrigid, flexibly distortable mechanical properties, such as high-density polyethylene, the pail having a peripheral rigidifying flange rising outwardly from the exterior of the sidewall commencing uniformly below the rim and forming an acute angle with the sidewall, the outer margin of the rigidifying flange terminating in a peripheral upwardly inturned short hook flange, and the cover member having a depending marginal flange wall terminating in a conic outwardly rising peripheral flange adapted to be forcibly nested upon the rigidifying flange with the edge engaged continuously under the hook flange, whereby axial pressure within the pail tends to enhance the sealing pressure along the contact areas of the outer and inner edges of the conic flange; either the conic flange or the rigidifying flange may be rigid, i.e. made of metal, if the other is polyethylene; where resistance to internal pressure is not required, roll-edge cover members may be snapped-on under the hook flange.

3,566,947

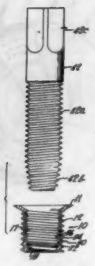
SELF-LOCKING THREADED INSERT

John A. Jukes, 7174 No. Hidden Place, San Gabriel, Calif.

Filed Apr. 29, 1969, Ser. No. 820,147
Int. Cl. F16b *13/04, 39/30*
U.S. Cl. 151—14 **7 Claims**

A thin walled tubular metal insert having a threaded exterior is threaded into a tapped hole in a base member by a tool

partially threaded into the interior of the insert. With the insert fully in place, further rotation of the tool completes the

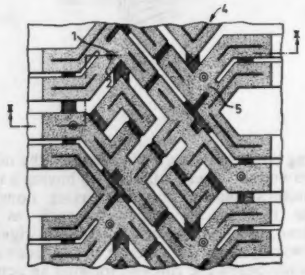


threads on a portion of the interior of the insert, thus bulging the insert walls outwardly to lock the insert in the tapped hole.

3,566,948
STUDDED VEHICLE TIRE

Hans Menell, Ahlem, and Johannes Kosanke, Letter, Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hannover, Germany

Filed Feb. 28, 1969, Ser. No. 803,343
Claims priority, application Germany, Mar. 1, 1968, C17,204
Int. Cl. B60c *11/16*
U.S. Cl. 152—210 **6 Claims**



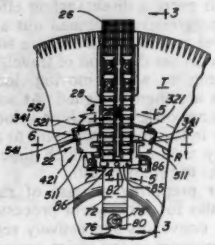
A pneumatic vehicle tire having a tread strip and a plurality of groups of skid protective studs of hard metal respectively arranged in said tread strip along different circumferential zones and protruding outwardly from said tread strip, said circumferential zones when viewing the tire in transverse direction thereof being located one behind the other, the wear resistance of the studs of at least one group being different from the wear resistance of the studs of at least another one of said groups.

3,566,949
TIRE-TRACTION CHAIN

Hans Schieber, 2270 W. Logan Blvd., and Paul Bindel, 3946 W. North Ave., Chicago, Ill.

Filed Mar. 6, 1969, Ser. No. 804,811
Int. Cl. B60c *27/20*
U.S. Cl. 152—237 **7 Claims**

A traction chain for automobiles, trucks, etc., whereby the ends of which have oppositely extending connectors attached

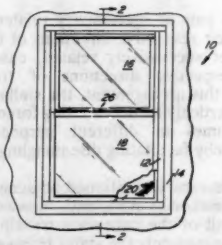


to the vehicle wheel rim on diametrically opposed sides thereof and to clamping members on the rim of said wheel.

3,566,950
WINDOW CONSTRUCTION

David R. Collins, Makefield Township, and Silvio F. Yannessa, Philadelphia, Pa., assignors to Air Master Corporation, Philadelphia, Pa.

Filed June 28, 1968, Ser. No. 740,949
Int. Cl. E06b *3/32*; **E05d** *15/18*
U.S. Cl. 160—101 **7 Claims**



A window construction wherein upper and lower sashes are slidably mounted in a frame, and a panel such as a screen member removably secured to the frame, securement of the panel being accomplished by means of a vertically slidable lock bar. In one embodiment the lock bar provides at its opposite edges a meeting rail-type weatherstrip abutting a lower bar portion of the upper sash and an upper bar portion of the lower sash, and rigidifies the frame.

3,566,951
METHOD OF EQUALIZING STRESSES IN THE CONVEYANCE AND GUIDANCE OF CONTINUOUS CASTINGS

Hans Schrewe, Duisburg-Ungelsheim, Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed Feb. 26, 1968, Ser. No. 708,076
Claims priority, application Germany, Feb. 24, 1967, 72880
Int. Cl. B22d *11/12*
U.S. Cl. 164—82 **7 Claims**

Conveying and guiding metal castings which had been cast in a mold in a continuous casting plant, by means of driven conveyor and support rollers. In order to preclude the formation of surface cracks and other faults in the castings, the

supporting rollers are driven in such a manner that the rollers first encountered by the casting move at higher torque than

subsequent rollers. Included are the travelling paths of the castings which have any shape, such as straight, curved or circular.

3,566,952

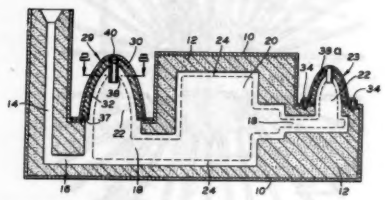
PRESSURE FEEDING OF CASTING USING A FEEDER HEAD

Wyman Curtis Lane, 1469 W. Lane Ave., Columbus, Ohio

Original application Oct. 26, 1967, Ser. No. 678,231, now Patent No. 3,513,904, dated May 26, 1970. Divided and this application May 22, 1969, Ser. No. 841,661

Int. Cl. B22d *27/14*

U.S. Cl. 164—120 **7 Claims**



A self-pressurizing feeder head vessel for pressure feeding molten metal into a casting mold is described. The feeder head vessel shown is a dome-shaped, fluid impervious shell with an open bottom, the shell being lined with green sand to define a feeder head cavity.

A porous cylinder or an apertured tube is provided at the top of the vessel so that steam formed by heat in the green sand may flow through the cylinder or tube and downward into the feeder head cavity and thus apply pressure on the molten metal in the feeder head cavity to force additional molten metal into the casting mold during the shrinking period.

Thus a method disclosed for applying pressure to the molten metal in the feeder head cavity is to vaporize the water in the green sand and apply the fluid pressure thereby generated to the molten metal, and thereby force the molten metal under pressure into the casting mold during shrinkage.

3,566,953

APPARATUS FOR FACILITATING THE HANDLING OF BILLETS

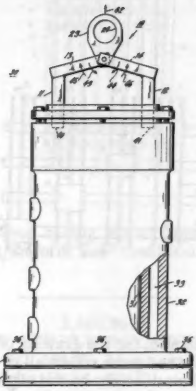
Joseph F. Bauman, Trenton, N.J.; John E. Karlberg, Wycombe, Pa., and Edward C. Rouze, Trenton, N.J., assignors to Acme-Hamilton Manufacturing Corporation, Trenton, N.J.

Filed Oct. 11, 1968, Ser. No. 766,797

Int. Cl. B22d *29/04*

U.S. Cl. 164—213 **6 Claims**

Apparatus for facilitating billet handling wherein the billet or slug is formed by pouring the molten material into a water-cooled mold having a pair of arcuate-shaped indentations for receiving the jaws of a slug-pulling assembly removably mounted within the indentations prior to filling the mold with the molten material. The slug-pulling assembly is lifted upwardly from the mold as soon as the molten



material has cooled, causing the small cleats formed within the slug-pulling assembly jaws to firmly grip the slug, enabling the slug to be lifted out of the mold and transported to the next operation. The slug-pulling assembly is provided with an eyelet member to facilitate releasable mounting of a lifting hook.

3,566,954

CONTINUOUS CASTING APPARATUS

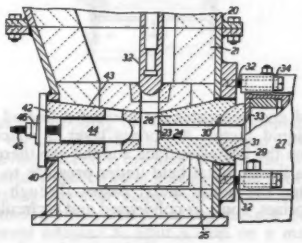
Peter Charles David Gamble, Middlesborough, and George Littler, Stockton-on-Tees, Teesside, England, assignors to Ashmore Benson, Pease and Company Limited, Stockton-on-Tees, Teesside, England

Filed Sept. 6, 1968, Ser. No. 757,982

Claims priority, application Great Britain, Sept. 8, 1967, 41,230

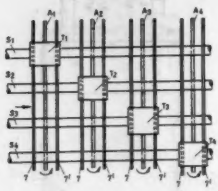
Int. Cl. B22d *11/10*

U.S. Cl. 164—281 **3 Claims**



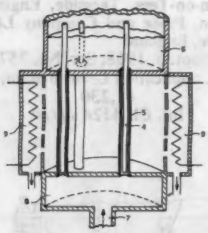
Apparatus suitable for continuous casting of metal comprises a tundish for receiving the metal to be cast, and a continuous casting mould and a nozzle extending from the tundish to the inlet of the mould and the nozzle is in sealed relation with both the tundish and the mould to prevent ingress of air and egress of molten metal between the nozzle and the mould. The cross-sectional area of the mould cavity is greater than that of the bore of the nozzle to prevent solidification of the molten metal in the nozzle. The longitudinal axes of the mould and the nozzle may be arranged either horizontal or vertical.

3,566,955
ADAPTABLE DRAWING MECHANISM OR DEVICE FOR PRODUCING STRANDS BY CONTINUOUS CASTING
Heribert Krall, Wurzburg, Germany, assignor to Technica-Guss GmbH, Wurzburg, Germany
Filed Apr. 1, 1968, Ser. No. 717,648
Claims priority, application Germany, Apr. 5, 1967, T33603
Int. Cl. B22d *11/12*
U.S. Cl. 164—282 2 Claims



A drawing mechanism for the drawing of strands consisting of conveying rollers and press rollers all of which being variable, laterally, on their drive shafts and alignment rails.

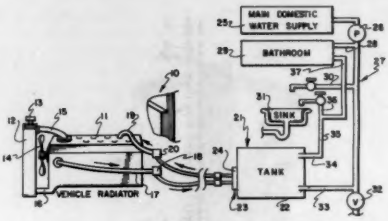
3,566,956
LIQUID METAL COOLING SYSTEM
Eleonoor Van Andel, Ispra, Italy, assignor to European Atomic Energy Community (Euratom), Brussels, Belgium
Filed June 10, 1968, Ser. No. 735,637
Claims priority, application Germany, June 16, 1967, 1551454
Int. Cl. F25b *13/00*
U.S. Cl. 162—2 3 Claims



A method and apparatus for cooling a heated surface by means of liquid metal. A porous layer is spaced a short distance from the heated surface and the gap therebetween is filled with a liquid metal held under pressure to prevent its boiling. After the liquid metal passes through the porous layer it vaporizes, cools, is condensed and recirculated.

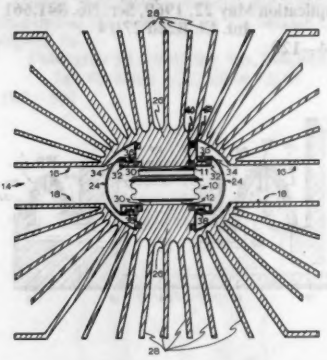
3,566,957
METAL-TO-METAL HEAT EXCHANGER FOR RECREATIONAL VEHICLE
James Earl Bridegum, 12143 Gothic Ave., Granada Hills, Calif.
Filed Apr. 16, 1969, Ser. No. 816,640
Int. Cl. F28f *11/00*
U.S. Cl. 165—70 10 Claims

A heat exchange unit for circulating vehicle radiator liquid is positioned in a large tank that conducts potable water so that the radiator liquid becomes cooled as the potable water becomes heated. The unit includes a container capable of being mounted to the tank and a conduit inserted in heat exchange relationship within the container. For safety purposes a narrow leakage gap is defined between the container and conduit so that any leakage of radiator liquid from the



conduit will automatically flow outwardly of the tank where it will be unable to contaminate the potable water.

3,566,958
HEAT SINK FOR ELECTRICAL DEVICES
William B. Zelina, Edinboro, Pa., assignor to General Systems, Inc., Erie, Pa.
Filed Dec. 18, 1968, Ser. No. 784,557
Int. Cl. H01l *1/12*
U.S. Cl. 165—80 4 Claims

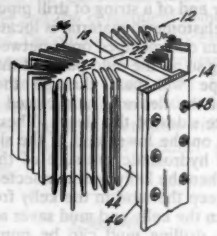


A cooling structure for pressure mounting electrical components having opposed contact surfaces wherein spring clamp means electrically insulated from and in clamping engagement with the edges of oppositely disposed heat dissipating members urges the members together to provide a pressure mounting heat sink for an electrical component disposed therebetween; the spring clamp means externally applying and maintaining a predetermined force on the component to effect the proper electrical and thermal contact between the component and the heat dissipating members.

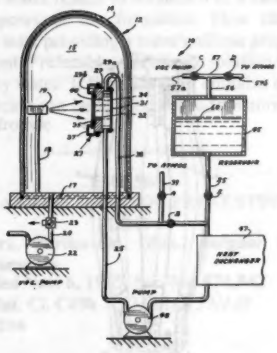
3,566,959
HEAT SINK
Michael A. Koltuniak, Warren, Mich.; Claybourne Mitchell, Jr., Ann Arbor, Mich., and Robert G. Plantholt, Rochester, Mich., assignors to Controlled Power Corporation, Farmington, Mich.
Filed July 17, 1969, Ser. No. 842,609
Int. Cl. F28f *7/00*
U.S. Cl. 165—80 12 Claims

An extruded aluminum heat sink for semiconductor rectifiers and having substantially identical right- and left-hand fin sections joined by an integral transverse horizontal web so that the heat sink is symmetrical about a vertical plane through the web. Each fin section has a relatively thick trunk portion that is tapered in thickness in a direction laterally outwardly from the web. A plurality of integral fins are disposed angularly to the trunk portion and project upwardly and downwardly therefrom so that the tips of the fins

define a rectangular transverse configuration. Integral with each fin section adjacent the web is a mounting leg that projects downwardly and has an outwardly turned flange at its lower end for mounting the heat sink on a support such as a copper bus bar.



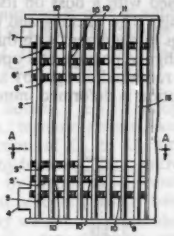
3,566,960
COOLING APPARATUS FOR VACUUM CHAMBER
Robley V. Stuart, 536 63rd Ave. N. E., Minneapolis, Minn.
Filed Aug. 18, 1969, Ser. No. 850,913
Int. Cl. F28d *15/00*
U.S. Cl. 165—107 **7 Claims**



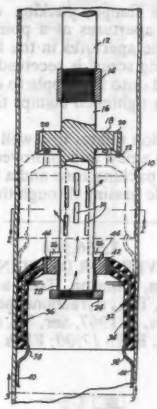
An apparatus for cooling a workpiece within a vacuum chamber consisting of a housing within said chamber, said workpiece overlying an opening into said housing, a cooling medium within said housing having direct contact with said workpiece, means cooling said cooling medium, and a diaphragm equalizing pressure between said vacuum chamber and the chamber within said housing.

3,566,961
TUBULAR REACTOR FOR CARRYING OUT ENDOTHERMIC AND EXOTHERMIC REACTIONS WITH FORCED CIRCULATION
Friedrich Lorenz, Neustadt, Weinstrasse; Joachim Wagner, Ludwigshafen, Rhine; Dieter Bettermann, Waldsee; Walter Mann, Lampertheim, and Johann Heinrich Walter, Ludwigshafen, Rhine, Germany, assignors to Badische Anilin - & Soda - Fabrik Aktiengesellschaft, Ludwigshafen, Rhineland-Pfalz, Germany
Filed Sept. 6, 1968, Ser. No. 757,957
Claims priority, application Germany, Sept. 6, 1967, Sept. 23, 1967, P 16 01 162.4/P 16 01 163.5
Int. Cl. F28f *9/22*
U.S. Cl. 165—159 **6 Claims**

A tubular reactor with forced circulation of a heat transfer medium which flushes the outside of the reaction tubes in axial direction, the heat transfer medium being supplied to, and withdrawn from, the reactor wall uniformly through circular pipelines, and particularly the constructional shape of deflecting guide plate means arranged transversely to the direction of flow and having annular openings around the reaction tubes for uniform flow towards all the tubes of the nest of tubes.



3,566,962
PIPE AND TUBING CATCHER
George W. Pease, Jr., 150 W. Maple, and Tipton T. Asher, P.O. Box 308, Fairfax, Okla. 74637
Continuation-in-part of application Ser. No. 763,245, Sept. 27, 1968, now abandoned. This application Sept. 5, 1969, Ser. No. 857,296
Int. Cl. E21b *33/129, 40/00*
U.S. Cl. 166—121 **13 Claims**



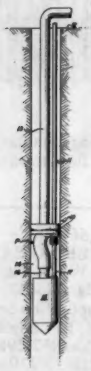
Apparatus for stopping the fall of a suspended weight in a cased area or tubing including a reinforced flexible sealing chamber having a central opening therein and a plurality of circumferentially spaced steel guides in said central opening, with the sealing chamber being hollow and having a dependent skirt therearound, and a sealing surface on the upper portion thereof adapted to abut a stop on a mandrel upon which the sealing chamber is disposed.

3,566,963
WELL PACKER
Jimmy T. Blackledge, Laurel, Miss., assignor to Mid-South Pump and Supply Co., Inc., Laurel, Miss.
Filed Feb. 25, 1970, Ser. No. 014,022
Int. Cl. E21b *23/00*
U.S. Cl. 166—189 **6 Claims**

This specification discloses a well packer for sealing off the bore of a well at a zone spaced above a pump in the well bore and which packer comprises a heavy circular flange formed integrally with the upper end of a pipe section connected to the pump, a threaded nipple on said section ex-

tending above the flange, a circular clamping plate of a diameter less than that of the flange and fitted onto the nipple, and a leather packing cup having a flat wall positioned between the flange and plate and a circular wall overlapping the periphery of the plate.

The flange is formed with a boss on its lower face which has a threaded passage. The packing and clamping plate are formed with openings in alignment with this passage. A cable passes through the aligned passage and openings and its relation to the flange is rendered airtight by a packing gland assembly. The pipe section is deformed immediately below the



flange to provide a bend which accommodates the packing gland assembly. The flange, packing cup and plate are formed with aligned apertures at a point diametrically opposite to the boss. The apertures in the flange and plate are threaded and a locking screw is received in these apertures. A coupling is screwed onto the nipple to connect the latter to a well pipe and when tightened clamps the packing between the flange and plate.

The present invention relates to a well packer, and is concerned primarily with a new and improved packer including a rigid structure at the packing zone and a fluidtight seal which accommodates a cable passing through the packer.

3,566,964

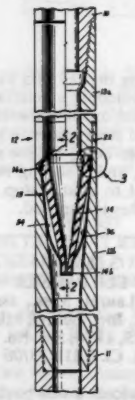
MUD SAVER FOR DRILLING RIGS

Charles S. Livingston, Houston, Tex., assignor to James B. Ringgold, Houston, Tex., a fractional part interest

Filed Nov. 9, 1967, Ser. No. 681,698

Int. Cl. E21b *17/00*; **F16k** *15/14*

U.S. Cl. 166—224 **5 Claims**



Apparatus is disclosed for attaching to the lower end of the kelly of a drilling rig to keep the drilling mud that is in the kelly from running out, when the kelly is disconnected from a drill string for any reason, e.g., to add another joint of pipe to the string. The mud saver includes a two-piece tubular housing for connection to the lower end of the kelly, between the kelly and the upper end of a string of drill pipe. An elongated sleeve of resilient elastomeric material is located in the housing with its upstream end clamped open between the two sections of the housing so all the mud pumped through the kelly into the drill pipe will pass through the sleeve. The downstream end of the sleeve is held closed by two springs located on opposite sides of the sleeve. These springs exert only enough force on the lower end of the sleeve to hold it closed against the hydrostatic pressure of the drilling mud above the sleeve when the kelly is disconnected from the drill string to thereby keep the mud in the kelly from flowing out its lower end. When the kelly and mud saver are reconnected in the drill string, drilling mud can be pumped down the kelly, through the sleeve, and into the drill string, and the pressure of the mud is more than sufficient to force the lower end of the sleeve open to permit the mud to flow through.

3,566,965

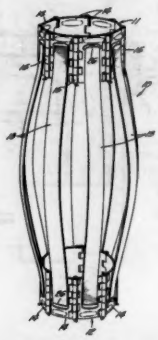
VARIABLE SIZE, MULTI-HINGE CENTRALIZER

James R. Solum, Huntington Beach, Calif., assignor to B & W Incorporated, Torrance, Calif.

Continuation of application Ser. No. 576,055, Aug. 30, 1966, now abandoned. This application July 22, 1968, Ser. No. 752,117

Int. Cl. E21b *17/10*

U.S. Cl. 166—241 **15 Claims**



A device for centering well pipes in a well bore or casing with spring bows extending between spaced collars which are adapted for mounting on the well pipe wherein each collar is assembled from a multiplicity of releaseable hinge-connected segments to create a circumference which will closely encircle the well pipe with the number of segments being variable for accommodating different sizes of well pipe and the arcuate shape of each segment not necessarily conforming to the well pipe. Each spring bow extends between and is mounted on one segment of each collar.

3,566,966

GAS PRODUCTION BY NUCLEAR STIMULATION

Eugene D. Glass, Tulsa, Okla., assignor to Cities Service Oil Company, Tulsa, Okla.

No Drawing. Filed Sept. 26, 1968, Ser. No. 762,988

Int. Cl. E21b *43/26*

U.S. Cl. 166—247 **6 Claims**

Gases in the chimney of broken reservoir rock formed by the detonation of a nuclear device are withdrawn as quickly as possible following the detonation. The gases are pumped to another geologic horizon for disposal until the level of long half-life, gaseous contamination drops below the tolerable limits for such contamination. By withdrawing the contaminated gases from the chimney quickly, the pressure in

the chimney at the time of withdrawal will be near that immediately after the nuclear explosion and will not have built up to values near the equilibrium pressure of the reservoir. The amount of reservoir gas contaminated with said radioactive contamination and the consequent disposal problem are thereby minimized. Decontaminating processes at the surface to reduce said long half-life, gaseous contamination may be avoided. When the level of said long half-life, gaseous radioactive contamination falls below the tolerable limits for such contamination, the gases thereafter withdrawn from said chimney may be recovered as product gas suitable for processing and use.

3,566,967

THERMAL PLUGGING WITH SILICATE SOLUTIONS

Jack L. Shelton; Syed H. Raza, and H. R. Froning, Tulsa, Okla., assignors to Pan American Petroleum Corporation, Tulsa, Okla.

Filed June 19, 1969, Ser. No. 834,899
Int. Cl. E21b *33/138, 43/24*
U.S. Cl. 166—261 **6 Claims**

In an underground forward combustion process for recovering petroleum from earth formations, more uniform progress of the combustion front through a formation over a wide area is obtained by injecting a water solution of a water-soluble silicate after the combustion operation has been started. As the solution approaches the combustion front, evaporation of water results in formation of a cohesive, solid mass in the pores of the formation. Flow channels are plugged in this way, providing a more uniform progress of the combustion front. Preferably, the silicate solution is preceded and followed by water. If the formation contains exposed silica, sodium silicate can be formed in the formation by injecting sodium hydroxide.

3,566,968

MATERIAL AND METHOD FOR PREVENTING FLUID FLOW

John W. Marx, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Nov. 6, 1969, Ser. No. 874,542
Int. Cl. C09k *3/12;* **E21b** *33/138*
U.S. Cl. 166—294 **9 Claims**

Preconditioned sponge particles in a water-free liquid are injected into fluid flow portions of the formation and expanded therein by contacting said particles with water to prevent lost circulation.

3,566,969

METHOD OF GELLING ORGANIC POLAR LIQUIDS AND COMPOSITIONS SO MADE, AND USE THEREFOR

Alfred R. Hendrickson, Tulsa, Okla., and Bobby L. Atkins, Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Continuation-in-part of application Ser. No. 323,140, Nov. 12, 1963, now abandoned. This application Dec. 12, 1966, Ser. No. 600,715
Int. Cl. E21b *43/26*
U.S. Cl. 166—299 **14 Claims**

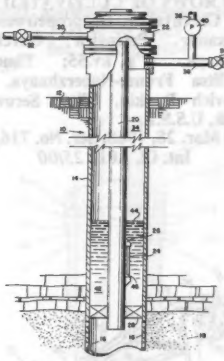
Organic polar liquids, e.g., halogenated alkanes, halogenated alkenes, tertiary amines, ketones, and esters formed by the reaction of C_1 to C_4 alcohols, ethyl- and methyl-substituted hydrazines, and nitroalkanes can be satisfactorily gelled by admixing therewith, first between about 1 and about 30 percent (usually between about 2 and about 20 percent), by weight, of an alcohol containing from 1 to 5 carbon atoms per molecule and then admixing therewith a cross linked N-vinylpyrrolidone polymer. The gelled composition so made has utility for use in explosives and as a carrier for pesticides, resin coatings and the like.

3,566,970

METHOD OF INJECTING TREATING LIQUIDS INTO WELL TUBING

Morgan L. Crow, and Robert W. McQueen, Dallas, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Feb. 13, 1969, Ser. No. 798,998
Int. Cl. E21b *43/00*
U.S. Cl. 166—310 **7 Claims**



This disclosure is of a method of introducing liquids into well tubing. The tubing has an injection valve and a packer located below the injection valve and expanded into contact with the casing. The liquid to be introduced into the tubing and a gas are introduced into the tubing-casing annulus. The gas pressure forces the liquid into the tubing through the injection valve against the pressure of the production within the tubing. The gas pressure may be varied to compensate for variations in tubing pressure.

3,566,971

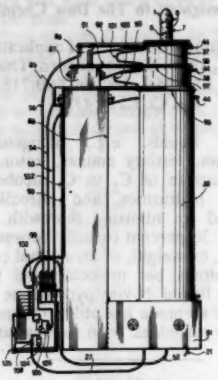
LIQUID JET FIREFIGHTING APPARATUS FOR USE IN BURNING MASSES MATERIAL AND IN FLAME-FILLED SPACES IN GENERAL

Pasquale Cocco, Cuneo, Italy (Michelangelo Bovi Corso Vittorio Emanulle No. 74, Turin, Italy)

Filed Sept. 26, 1968, Ser. No. 762,892
Claims priority, application Italy, Oct. 7, 1967, 818,615
Int. Cl. A62c *25/00*
U.S. Cl. 169—2 **13 Claims**

An apparatus for extinguishing fires having one or more tubular rods having at their ends nozzles which receive,

through the hollow interior of said rods, a liquid extinguishing material provided by the action of a pump. The apparatus



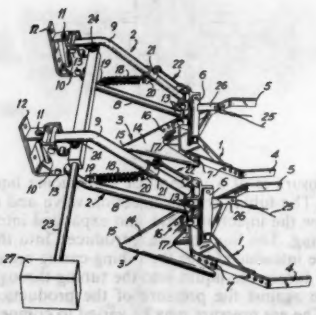
extinguishes fires by supplying the liquid extinguishing material, through the hollow interior of the rods, to the interior of the fires.

3,566,972

SENSING UNIT FOR AN AUTOMATIC CONTROL SERVOSYSTEM OF A HARVESTING MACHINE, OPERATING IN ROWS OF CULTIVATED CROP FIELDS

Felix Aronovich Chernyakov, Dnepropetrouskaya ulitsa, 2a, Kv.19; Alexandr Petrovich Gurchenko, Ulitsa Dnepropetrovskaya, 4"g,"kv.55; Timofei Petrovich Kruglikov, Ulitsa Frunze-Naberzhnaya, 29,Kv.9, and Marat Borisovich Dynkin, Ulitsa Serova, 15, Kv.26, Dnepropetrovsk, U.S.S.R.

Filed Mar. 28, 1968, Ser. No. 716,787
Int. Cl. A01d *25/00*
U.S. Cl. 171—8 **5 Claims**



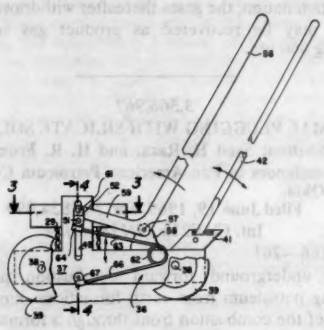
A sensing unit is provided for an automatic control servosystem of a harvesting machine operating for example in rows of sugar beets. The unit comprises at least one plant detector which moves below the soil surface, in the top layer thereof, in contact with the root parts of the beets in the ground and a duckfoot is urged by a spring into the ground adjacent the beets and cuts the ground to insure movement of the detector in the upper layer of soil for contact with the root parts. The duckfoot and plant detector are connected by a parallelogram linkage to the harvesting machine and the linkage incorporates a spring which urges the duckfoot against the ground.

3,566,973

LAWN-AERATING MACHINE

Charles S. Blair and Walter Bradley, Redwood City, Calif., assignors to said Bradley assignor to said Kramer

Filed Aug. 5, 1968, Ser. No. 750,244
Int. Cl. A01b *45/02*
U.S. Cl. 172—21 **2 Claims**



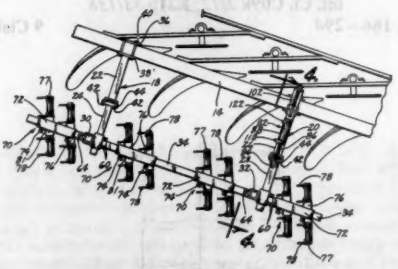
A lawn-aerating machine has a chassis which may be moved about the lawn on wheels. A transmission case moves vertically relative to the chassis and from the case depend drills shaped to dig holes in the lawn. A prime mover drives each of the drills. Means is provided to lower the drills relative to the chassis under control of the operator.

3,566,974

PLOW MULCHER

Arnold F. Kopaska, Guthrie Center, Iowa

Filed Nov. 20, 1968, Ser. No. 777,293
Int. Cl. A01b *49/02*
U.S. Cl. 172—202 **18 Claims**

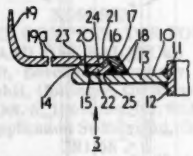


A plow having a pivotally mounted plow mulcher connected to the plow frame through hinged arms. A plow mulcher frame is carried on the outer ends of the hinged arm and may be moved between raised and lowered positions by operation of an overcenter spring arrangement, hydraulic cylinder and cable arrangement, or a hydraulic cylinder extending between the plow frame and the outer hinged arm portion. A cushioning spring may be provided for the hydraulic cylinder to yieldably permit raising of the mulcher frame without contracting the hydraulic cylinder. The mulcher and the plow may be operated from a common hydraulic power source through separate hydraulic cylinders connected together such that the mulcher is raised and lowered first due to its lower power requirements. Unlimited adjustability is provided in the mulcher structure to position the mulcher as desired relative to the plow.

3,566,975
MOUNTING EARTH-WORKING TOOLS ON THE ROTOR OF A CULTIVATING MACHINE

Arthur Clifford Howard, and John Arthur Howard, West Horndon, England, assignors to Rotary Hoes Limited, West Horndon, Essex, England

Filed Feb. 24, 1969, Ser. No. 805,975
Int. Cl. A01b *21/04*
U.S. Cl. 172—540 **7 Claims**

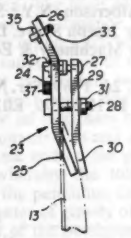


An earthworking tool and tool holder and a combination thereof are for use with a rotor of a cultivating machine, and the tool and tool holder are provided with a quick release securing mechanism including a root element on the tool or the tool holder which engages between corresponding wedging surfaces on the tool holder or tool respectively. The mechanism is such that during operation movement of the tool in its working direction tends to increase the wedging engagement between the tool and holder.

3,566,976
DISC BLADE-HOLDING DEVICE

Evert Jan Heersink, Hinsdale, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed July 12, 1967, Ser. No. 652,798
Int. Cl. A01b *21/08*
U.S. Cl. 172—601 **4 Claims**



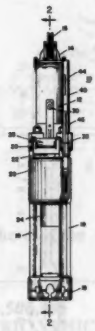
A holding device for use in assembling and disassembling and rigidly securing the discs of the harrow gang on an arbor bolt comprises a clamp releasably connected to the supporting beam or gang bar including a pair of clamping elements extending downwardly and clasping the upper edge of one of the discs, a lug affixed to one of the clamping elements projecting in one direction therefrom engaging the lower face of the gang bar.

3,566,977
PERCUSSION HAMMER

George C. Wandell, Soddy, Tenn., assignor to Vulcan Iron Works Inc., Chattanooga, Tenn.

Filed Aug. 1, 1969, Ser. No. 846,720
Int. Cl. B25d *9/00*
U.S. Cl. 173—90 **7 Claims**

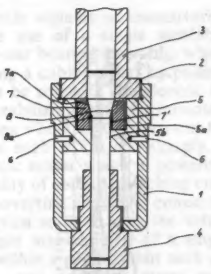
There is provided a percussion hammer of the type including a cylinder and a piston operable in the cylinder connected to a ram through a piston rod. Valve means are provided for cycling working fluid into and exhausting the working fluid from the cylinder to cycle the tool through power and return strokes. The cycling valve is controlled by a suitable actuator or slide bar connected to the ram and provided with cams for actuating a trip. The ram is provided with removable weights so as to permit alteration of the operating characteristics of the hammer. In addition there is provided an improved means of fastening the piston rod to the ram and of connecting the slide bar to the ram. A detent is provided for latching the valve trip in the desired position.



3,566,978
APPARATUS FOR DRIVING ANCHORING ELEMENTS FOR A PREDETERMINED DEPTH OF PENETRATION

Karl-Ernst Udert, Triesen, Liechtenstein, assignor to Hilti Aktiengesellschaft, Schaan Furstentum, Liechtenstein

Filed Jan. 17, 1969, Ser. No. 792,033
Claims priority, application Germany, Jan. 29, 1968, P 16 03 852.1
Int. Cl. B25c *1/14*
U.S. Cl. 173—139 **8 Claims**



An arrangement for driving anchoring elements into a target material to obtain a predetermined reproducible depth of penetration is achieved by providing a driving force in excess to that necessary to fix the anchoring elements in place. After an anchoring element is driven to a predetermined depth the excess energy supplied is transformed into thermal energy by placing the member driving the anchoring element in frictional contact with a stop member. The portion of the excess energy not transformed into thermal energy is transferred from the stop member to another member.

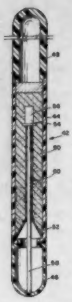
3,566,979
FORMATION MARKING SYSTEM

John D. Bennett and Stanley B. McCaleb, Richardson, Tex., assignors to Sun Oil Company, Philadelphia, Pa.

Filed Dec. 26, 1968, Ser. No. 787,065
Int. Cl. E21b *7/00*
U.S. Cl. 175—2 **4 Claims**

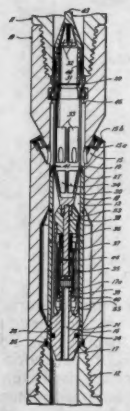
The particular embodiment described herein as illustrative of one form of the invention utilizes, in a drilling system, capsules which are moved at high velocities out the eye of the drill bit to be impacted with the formation being drilled.

Marking materials in the capsules are thereby embedded within the formation. In one embodiment, explosive charges fracture rock formations while the drilling operation is taking



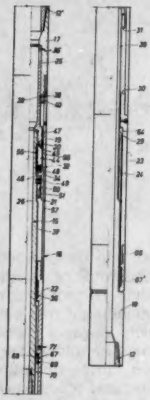
place. A radioactive substance is included in the charge for marking the formation to identify and correlate the formation material at drilling depth.

3,566,980
UNDERBALANCED DRILLING SUB
Elva J. Scroggins, Lafayette, La., assignor to Drilling Well Control Inc., Houston, Tex.
Filed Dec. 3, 1969, Ser. No. 881,837
Int. Cl. E21b *41/00*
U.S. Cl. 175—65 **9 Claims**



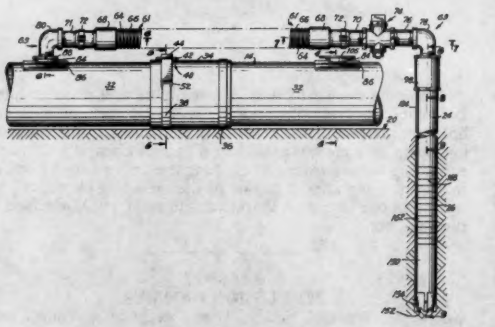
A pressure reducing apparatus insertable in a drill string to reduce the fluid pressure immediately surrounding the drill bit and a method for accomplishing pressure reduction. It includes a body with an axial bore, fluid passages in the body communicating with the annulus of the well, and means to divert normal axial drilling fluid flow upwardly through the opened passages. When the fluid is diverted through the passages, a venturi effect is created, thereby reducing the pressure on the drill bit in the area below the passages. The method includes diverting the axial flow of the drilling fluid by restriction of a portion of the inner bore of the well string while the fluid is pumped at a substantially constant rate.

3,566,981
HYDRAULIC DRILLING JAR
Frank C. Love, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.
Filed Sept. 15, 1969, Ser. No. 858,025
Int. Cl. E21b *1/10*
U.S. Cl. 175—297 **6 Claims**



A hydraulic well jar having a metering system and a spline system located in separate, fully enclosed constant volume chambers to minimize seal wear and to enable use of a hydraulic fluid in the metering system and a lubricating oil for the splines.

3,566,982
WELL POINT SYSTEM
Jacob Henry Share, Albertson, N.Y.; Stanley Share, Ormand Beach, and Seymour Joseph Share, Daytona Beach, Fla., assignors to Complete Machinery & Equipment Co., Inc., Albertson, N.Y.
Filed Mar. 26, 1969, Ser. No. 810,581
Int. Cl. E21b *39/00;* **E02b** *11/00*
U.S. Cl. 175—314 **15 Claims**



A well point system including snap-in coupling means between each of the connecting means and the header pipe unit and respective well point assembly. The coupling means includes a sleeve and an insert adapted to be disposed therein, said insert having an outer wall formed with at least one circumferential channel and including a resilient sealing member disposed in said channel for forming a fluid-type seal with said sleeve. The header pipe unit is provided with a sheath snuggly receiving the adjacent ends of adjacent pipe

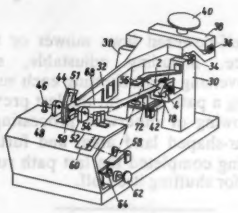
sections, said sheath being pressingly engaged against each of said pipe section by means of bands disposed about the outer peripheral surface thereof. One of said bands is provided with clamp means for releasably securing said band to permit the assembly and disassembly of the header pipe unit. The well point assembly includes spaced inner and outer conduits, the outer conduits being formed with a plurality of axially spaced slits therethrough, each extending partially about the circumference thereof.

3,566,983

OPTICAL LEVEL COMPENSATOR FOR PRECISION AND FINE BALANCES

Ludwig Weickhardt, Bovenden, Germany, assignor to Sartorius-Werke GmbH, Gottingen, Germany

Filed Oct. 6, 1969, Ser. No. 863,906
Claims priority, application Switzerland, Oct. 9, 1968, G15 281/68
Int. Cl. G01g *23/14, 23/32, 1/02*
U.S. Cl. 177—173 **8 Claims**



A level compensator for a precision and fine balance comprising a balance frame, a balance beam, a support for said beam, a microscale provided on the beam, a screen, and a projection apparatus for the reproduction of a section of the microscale on said screen. The level compensator comprises a pendulum provided on the balance frame for automatic level compensation. The support axis of the pendulum is arranged parallel to the support axis of the balance beam. A light reflecting member is situated on the pendulum and deflects the projection light beam. The center of gravity of the pendulum lies above an imaginary horizontal plane comprising the pendulum support axis and a spring arrangement acts on the balance frame and on the pendulum beyond the support axis thereof whereby the torque exerted by the spring arrangement on the pendulum counteracts the torque brought about by the center of gravity of the pendulum.

The center of gravity of the pendulum lies laterally above the support axis of the pendulum.

An adjusting weight is adjustable in relation to the support axis of the pendulum.

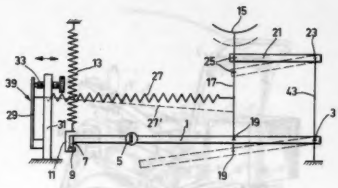
3,566,984

BEAM SPRING BALANCE WITH RIGIDITY-CONTROLLING EQUALIZER SPRING

Ludwig Weickhardt, Bovenden, Germany, assignor to Sartorius-Werke G.m.b.H., Gottingen, Germany

Filed Sept. 26, 1969, Ser. No. 861,310
Claims priority, application Germany, Oct. 2, 1968, P 18 00 689.8
Int. Cl. G01g *3/04, 1/24, 23/02*
U.S. Cl. 177—225 **7 Claims**

A spring balance having a balance beam, at least one spring acting on the balance beam and absorbing the load torque, and an arrangement for adapting the balance to changes in the force of gravity. The arrangement comprises at least one equalizer spring one end of which is connected to the balance support mounting by means of a device for changing the length thereof and the other end of the equalizer spring is fastened on the beam, or on a part of the balance connected to the beam for common movement. The arrangement is such that the direction of force of the equalizer spring in the neutral position of the balance extends approximately at right angles to the direction of movement of the fastening point on the balance beam or balance part and, with the balance loaded, a force component of the equalizer spring exerts on the balance beam torque directed against its



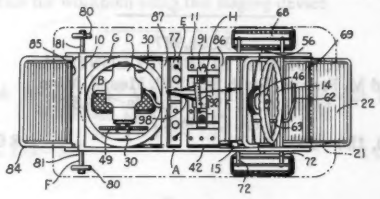
deflection by the load whereby the rigidity of the spring system can be changed.

3,566,985

ELECTRIC VEHICLE

James T. Triplett, Shamrock Drive, Chester, S.C.

Filed May 7, 1968, Ser. No. 727,271
Int. Cl. B62d *9/00*
U.S. Cl. 180—26 **3 Claims**



An electric vehicle capable of maneuvering in restricted areas through the use of a single steerable drive wheel mounted on a circular bearing assembly, which has a groove therein for receiving a cable so that by pulling the cable the steering wheel can be rotated. The electric vehicle has outwardly extending stabilizing members mounted on the frame adjacent the steering wheel so as to prevent the vehicle from turning over when such is cut too sharply. The vehicle is driven by an electric motor which is powered by a DC battery having a plurality of cells. A switching circuit is provided for sequentially converting a parallel connection of the cells to a series connection so as to vary the voltage supplied to the motor by simple manipulation of a single handle. The battery is carried within a pack so that such can be removed from the vehicle, and another battery pack substituted therefor, while such is being charged. Positioned adjacent the rear of the vehicle is a pivotal platform upon which the operator stands while driving the vehicle. A braking shoe is coupled to the pivotal platform so that when the operator shifts his weight forward on the platform such engages a wheel, stopping the vehicle. However, if the operator shifts his weight to the rear, the braking shoe will be raised off the wheel permitting the vehicle to move. The position of the rear axle of the vehicle can be readily adjusted by merely manipulating a locking mechanism and shifting the axle to the desired position.

3,566,986

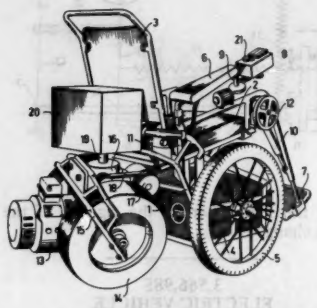
SELF-PROPELLED WHEELCHAIR

Per Edward Carl Udden, General Delivery, Timra, Sweden

Continuation-in-part of application Ser. No. 751,016, June 7, 1968, now abandoned , which is a continuation of application Ser. No. 540,652, Apr. 6, 1966, now abandoned. This application May 15, 1969, Ser. No. 824,907
Int. Cl. B60k *7/00, 17/30*
U.S. Cl. 180—52 **8 Claims**

A pair of nonsteerable main wheels are disposed at opposite sides of the frame of the wheelchair. A drive unit is disposed at the rear of the frame and is swingably interconnected therewith. This drive unit includes a drive motor and

a pair of driving wheels. A self-braking driving transmission connects the motor with the driving wheels. A steering motor is also incorporated in the unit and a self-braking transmission connects the steering motor with a member fixed to the frame to cause swinging movement of the unit with respect to the frame.



3,566,987

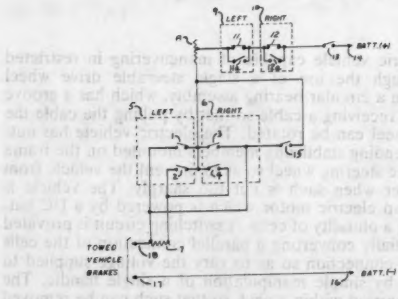
AUTOMATIC STABILITY CONTROL

Richard M. Franzel, Rte 1, Box 580, Mound, Minn.

Filed Oct. 8, 1968, Ser. No. 765,829

Int. Cl. B60t *7/20*

U.S. Cl. 180—103 **8 Claims**



An improved stability control system for towed vehicles to overcome the inherent swaying and swerving tendency by the provision of two sensing units responsive to lateral acceleration, one sensing unit (*a*) located in the rear of the towed vehicle and the other sensing unit (*b*) located in the front of the towed vehicle or in the prime mover which, when activated by lateral acceleration forces in the prescribed way will automatically cause the brakes of the towed vehicle to be energized and immediately apply corrective action, the prescribed operation is such that when the towed vehicle is disturbed and starts to sway or swerve, sensor (*a*) will experience lateral acceleration while sensor (*b*) experiences little or none, this condition will automatically cause the brakes of the towed vehicle to apply corrective action, if sensor (*b*) receives approximately the same lateral acceleration such as in a slow 90° turn or a moderate turn at highway speeds, sensor (*b*) will cancel the signal from sensor (*a*) thus, eliminating unnecessary braking applications, further if catastrophic conditions exist, such as in a "jackknife" skid which results in extreme lateral acceleration, sensor (*b*) will reinstate the signal from sensor (*a*) and provide immediate corrective braking action to the towed vehicle.

3,566,988

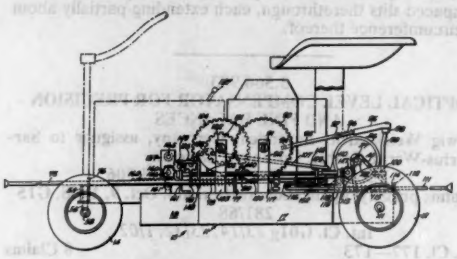
DRIVERLESS LAWN MOWER

John D. Wise, 99 E. 33rd, Paterson, N.J.

Filed Mar. 3, 1969, Ser. No. 803,562

Int. Cl. B62d *5/00*

U.S. Cl. 180—79 **8 Claims**



A driverless, self-powered lawn mower or the like land processing device, including adjustable, self-contained mechanism for reversing and offsetting each successive path line of travel along a path adjacent the last previous path for systematically mowing or otherwise processing a predetermined rectangular-shaped land area, and further including means, after having completed the last path run of the area being processed, for shutting itself off.

3,566,989

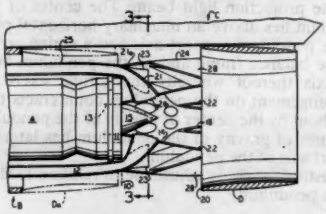
SOUND SUPPRESSION NOZZLE STRUCTURE FOR FAN JET AIRCRAFT ENGINE

Peter H. Ellis, Chula Vista, Calif., assignor to Rohr Corporation, Chula Vista, Calif.

Filed Dec. 1, 1969, Ser. No. 881,204

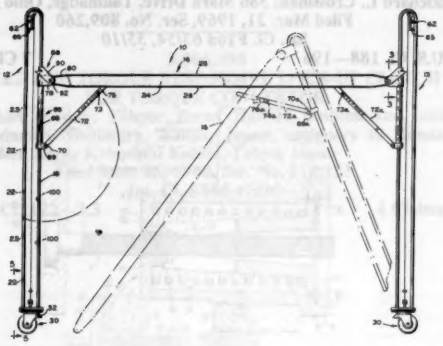
Int. Cl. F01n *1/00;* **B64d** *33/06*

U.S. Cl. 181—51 **9 Claims**



A turbofan jet aircraft engine has a fan air plenum chamber housing mounted coaxially of the engine and downstream of the engine exhaust duct, the downstream end of the housing having an opening therein to form a central fan air discharge nozzle. A plurality of circumferentially spaced fan air inlet tubes communicate the housing with the usual annular fan air duct surrounding the engine, and a plurality of short ducts, interposed in interdigitated relation between the fan air inlet tubes, discharge the remainder of the fan air into the main stream of primary exhaust gases closely adjacent the engine. A plurality of fan air nozzle tubes also radiate from the plenum chamber housing, and extend downstream to surround the central nozzle. A fluted tailpipe, coextensive with the outer wall of the annular fan air engine duct, surrounds the plenum chamber and all of the ducts and nozzles. A retractable ejector ring, preferably acoustically lined, is mounted for movement from retracted position surrounding the tailpipe to deployed position just downstream of the nozzle exit plane.

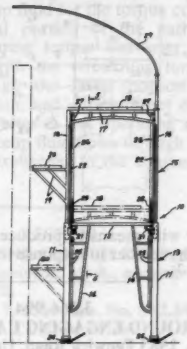
3,566,990
PORTABLE SCAFFOLD
Anthony T. Fredricks, 25 Horizon Drive, and Paul F. Smith, 4621 Mountain View Drive, Boise, Iowa
Filed Dec. 12, 1968, Ser. No. 783,191
Int. Cl. E04g 1/30
U.S. Cl. 182—17 21 Claims



A portable scaffold having a pair of caster-mounted ladder ends joined by a vertically adjustable platform. The casters have brake shoes which can be applied remotely from the platform to stop swivel of the casters and rotation of the caster wheels. A pair of sliding members, vertically slideable along the ladder sides, is connected to the platform enabling sliding adjustment of the platform. Pivoted locking brackets carried by the glides provide selective locking of the platform at different positions along the ladder sides. Butt hinge halves at the top of each ladder, releasable and adjustable corner braces and quick-disconnect pivotal connections of the platform with the glides permit folding of the platform into a compact package and also permit quick conversion of the two ladder ends into a trestle ladder or the ladder ends separately into two lockable, caster-mounted straight ladders.

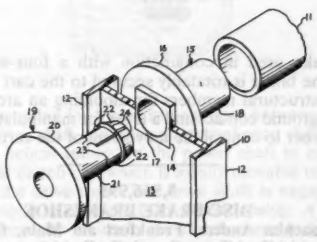
3,566,991
TELESCOPING STAGING
Leo R. Proulx, 66 Cypress St., Manchester, N.H.
Filed June 4, 1969, Ser. No. 830,305
Int. Cl. E04g 1/18, 1/26
U.S. Cl. 182—129 2 Claims

This invention relates to a telescoping staging which may be operatively raised and lowered to desired height levels. There is also provided a canopy member supported by the



movable portion of this staging which offers environmental protection for workmen using this staging device.

3,566,992
LADDER
Lewis W. Berger, 1163 Algonquin Parkway, Louisville, Ky.
Filed Jan. 12, 1970, Ser. No. 002,151
Int. Cl. E06c 7/08, 7/50
U.S. Cl. 182—228 8 Claims

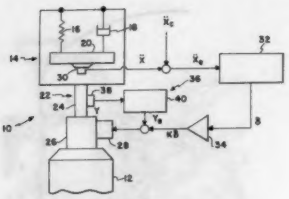


A ladder having a side rail with a noncircular opening therethrough. A first element extends through the opening and has a portion complementing the configuration of the opening. The first element also has a portion forming a flange and another portion secured to an adjacent rung. A second element is secured to the first element and has a flange which cooperates with the flange of the first element to sandwich the side rail therebetween.

3,566,993
ACTIVE VIBRATION ISOLATOR FOR FLEXIBLE BODIES
Jack D. Leatherwood, Hampton; David G. Stephens, Yorktown, and Gray V. Dixon, Hampton, Va., assignors to the United States of America, as represented by the Administrator of the National Aeronautics and Space Administration
Filed Mar. 26, 1969, Ser. No. 810,575
Int. Cl. F16f 15/02
U.S. Cl. 188—1 2 Claims

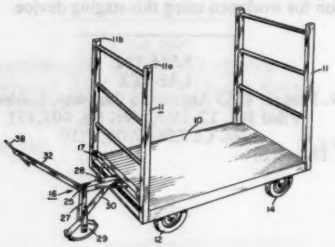
This disclosure is related to an active vibration control arrangement for isolating a flexible body from disturbances applied either externally or internally by inertial or other forces created by the body itself, and consists of an actuator having

a movable element drivingly connected to the flexible body, controlled by a signal produced by excitatory reaction of the



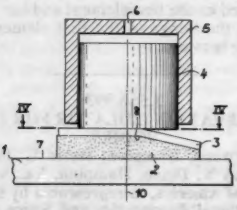
body together with means to produce a nullifying movement of the movable member in response to the signal.

3,566,994
GROUND ENGAGING CART BRAKE
Harold Isaacs, 2583 Fenwick Road, University Heights, Ohio
Filed Apr. 1, 1969, Ser. No. 812,055
Int. Cl. B60t *1/14*
U.S. Cl. 188—5 **5 Claims**



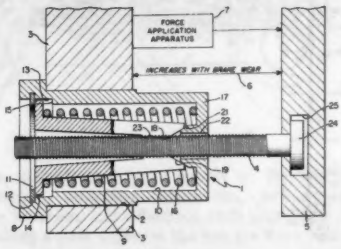
A brake used in conjunction with a four-wheel cart in which the brake is rotatably secured to the cart and includes several structural members for mounting an arcuate friction pad for ground contact and a lever for manipulating the arcuate member to control the movement of the cart.

3,566,995
DISC-BRAKE BRAKESHOE
Hans Joachim Anders, Frankfurt am Main, Germany, assignor to Alfred Teves G. m.b.H., Frankfurt am Main, Germany
Filed Dec. 11, 1968, Ser. No. 782,849
Claims priority, application Germany, Dec. 15, 1967, P 16 25 831.4
Int. Cl. F16d *66/02*
U.S. Cl. 188—73.1 **5 Claims**



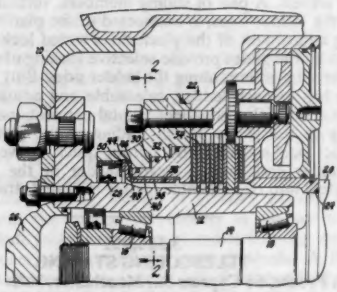
A disc-brake brakeshoe has a backing plate carrying a brake lining. This plate has a portion bent toward the disc along a bend line which is removed or offset from the center of the shoe and is generally directed toward the center of a brake disc. When the brakeshoe is greatly worn, the trailing, inwardly bent edge contacts and scrapes against the brake disc, thereby creating an audible signal for the driver, without imparting braking characteristics since the major portion of the lining remains effective at least until the operator of the vehicle has recognized the danger and had an opportunity to replace the brakeshoe or have the backing plate relined.

3,566,996
AUTOMATIC BRAKE ADJUSTER
Richard L. Crossman, 386 Mark Drive, Tallmadge, Ohio
Filed Mar. 21, 1969, Ser. No. 809,260
Int. Cl. F16d *65/54, 55/10*
U.S. Cl. 188—196 **7 Claims**



An automatic brake adjuster for use on disc brakes having a pressure plate axially movable with respect to the brake housing. The adjuster has a threaded pin with one end attached to the brake pressure plate with the threaded portion of the pin extending through an internally threaded gripping member which extends through the brake housing. The threaded portion of the internally threaded member is radially outwardly expandable to permit disengagement of the threaded portion of the member from the threaded pin thereby permitting the pin to be moved by the pressure plate axially with respect to the internally threaded member. As lining wear increases in the brake, the distance between the pressure plate and the brake housing increases and the threaded pin is moved farther and farther through the threaded member. The position of the threaded pin with respect to the brake housing determines the amount of spacing between the brake housing and the pressure plate and this in turn determines the amount of clearance in the brake.

3,566,997
BRAKE-ADJUSTING MECHANISM
Burnette Heck, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed June 2, 1969, Ser. No. 829,348
Int. Cl. F16d *65/54, 55/46*
U.S. Cl. 188—196 **6 Claims**



An annular brake piston is provided with a sheet metal cylinder press fitted onto one surface of the piston and ar-

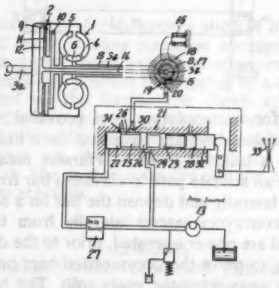
ranged to move with the piston for a limited distance. If the required movement of the piston exceeds the limited distance, further movement of the sheet metal cylinder is prevented while the additional movement of the piston still occurs. This causes a readjustment of the press fitted position of the cylinder on the piston, and when the piston returns to the released position it is prevented from returning as far as before. The surface of the piston on which the cylinder has been press fitted is provided with relief recesses spaced circumferentially so that the desired resistance to slip may be obtained without requiring close tolerance dimensions to be held.

3,566,998

SPEED AND TORQUE RESPONSIVE LOCK-UP CLUTCH FOR TORQUE CONVERTOR

Soichiro Honda, Tokyo; Torao Hattori, Saitama-ken, and Sadanori Nishimura, Tokyo, Japan, assignors to Honda Giken Kigyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 25, 1969, Ser. No. 810,155
Int. Cl. F16d *47/06*
U.S. Cl. 192—3.3 **4 Claims**



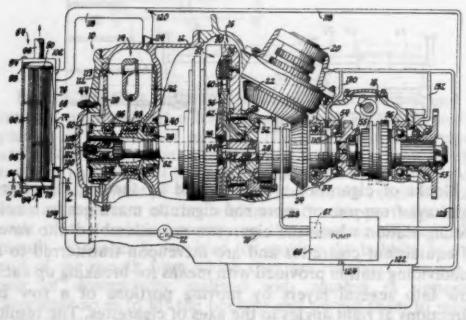
In a transmission, the connection of driving and driven shafts can be direct or through a torque converter. Selection of one or the the other is controlled by a valve controlled by torque ratio. A second valve is used which responds to shaft speed. This second valve controls actuation of the first said valve. The second valve is adjustable for selecting different speed responses and is designed to avoid hunting or chatter.

3,566,999

FLUID COOLING SYSTEM

Donovan L. Robinson, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed July 9, 1969, Ser. No. 840,371
Int. Cl. F16d *33/00, 13/72, 13/74*
U.S. Cl. 192—3.28 **8 Claims**



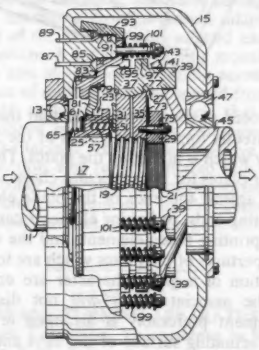
A transmission having a torque-converter drive and an alternate mechanical drive between the transmission input and output members where the torque converter, during drive operation, provides a centrifugal pressure head between the fluid inlet to the operating chamber and the fluid outlet from the operating chamber for the circulation of the torque converter operating fluid through the labyrinth path of a heat exchanger. The makeup fluid for the torque converter is connected to the central portion of the path of the heat exchanger so that during torque converter operation the makeup fluid flows with the circulating torque converter operating fluid through the latter portion of the heat exchanger labyrinth path, and during direct drive operation when the torque converter is not operating and creating a pressure head, the makeup fluid flows through both halves of the path of the heat exchanger to the torque-converter exhaust.

3,567,000

OVERRUNNING CLUTCH COUPLING

Elmer A. Richards, Kalamazoo, Mich., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed July 17, 1969, Ser. No. 842,592
Int. Cl. F16d *13/24*
U.S. Cl. 192—47 **8 Claims**



A clutch coupling for transmitting torque between a power shaft and a drive shaft comprising a pair of cone clutch plates mounted on helical splines on the power shaft to cooperate with a coaxial clutch cup which is axially movable relative to a flange on the drive shaft. The drive shaft is engaged with the clutch cup in a rotational drive relationship. A blocker mechanism serves to maintain the clutch cones in light contact with the cup, thereby allowing the cone plates to act upon the cup and transmit torque in either a clockwise or counterclockwise direction. Collapsing the blocker mechanism by pressurization of a fluid motor will allow torque to be transmitted in one direction only.

3,567,001

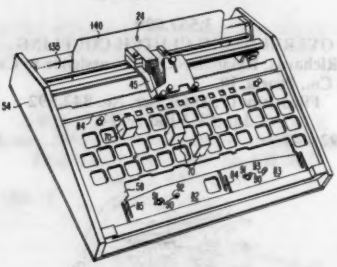
KEY-RESPONDING SELECTOR MECHANISM

Reynold Benjamin Johnson, Palo Alto; Edward Everett Long, and George Edmund Price, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 2, 1969, Ser. No. 829,652
Int. Cl. B41j *7/74*
U.S. Cl. 197—1 **8 Claims**

The construction of mechanical devices having a multiple of elements to be actuated selectively in varying combinations is enhanced by use of a shiftable selector plate which can be punched from sheet stock and/or molded accurately and inexpensively. The selector plate has a movable rectangular selecting section integrally connected to two colinear guiding sections by means of three flexible bar sections arranged one between each section. The guiding sections have individual intermediately located pivot bores dividing the sections in like proportions. Pivot pins in the pivot bores restrain the guiding sections to pivotal movement about the

bores. This restrains the movement of the other section to a line absolutely perpendicular to the line defined by the pivot pins in the pivot bores. Each of the selecting sections of the selector plates has a multiple of substantially square apertures in registry with corresponding apertures in all of the other plates. Keys are extended through the apertures in all of the selector plates in registry. The keys in the plates have surfaces cooperating with edges of the apertures of the plates defining the forward direction of the plates of two different characteristics distributed in predetermined permutation for all of the keys. Depressing a key shifts the selector plates relative to one another in accordance with the distribution of the two different characteristics. The guiding sections of the



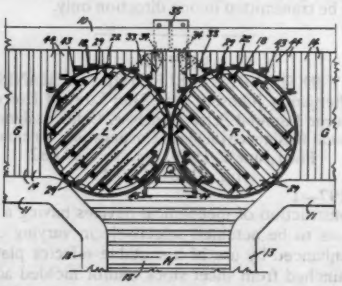
plates are pivoted at central points so that the selecting sections move directly forward regardless of the location of the particular key which is actuating the plates. The leading edge of the selector plates for the particular character desired may bear directly against the ends of the blade elements remote from the printing ends, or linking elements can be interposed between the printing blade elements and the selector plates. The square apertures of the plates which are to remain at rest for the selection of a given character are enlarged so that depressing the associated key will not disturb them. A camming element preferably is arranged in the apertures between the actuating surface of the keys and the actuating surfaces of the selector plates to provide more uniform motion.

3,567,002

LOAD TRANSFER DEVICES FOR CONVEYORS

Raymond W. Russ, 30 S. Jasmine St., Denver, Colo.

Filed Mar. 12, 1969, Ser. No. 815,241
Int. Cl. B65g *47/00, 47/26*
U.S. Cl. 198—25 **3 Claims**



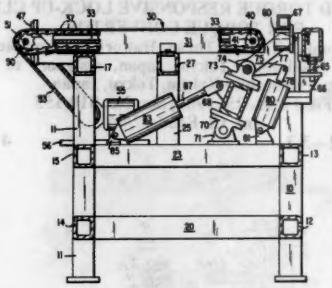
Two similar, closely adjacent turntables independently mounted in the travel plane of a main roller conveyor. Each turntable being provided with a plurality of parallel, power driven table rollers lying in the plane of the rollers of the main roller conveyor. The turntables being independently rotatable so that the table rollers can be directed in any desired direction so as to direct loads from the main conveyor onto intersecting side roller conveyors or from the side conveyors onto the main conveyor in either direction.

3,567,003

BAR ACCUMULATING APPARATUS

Donald L. Towne, North Syracuse, and Robert L. Schaller, Camillus, N.Y., assignors to Sundstrand-Engelberg, Inc.

Filed Oct. 22, 1968, Ser. No. 769,604
Int. Cl. B65g *47/00, 13/02*
U.S. Cl. 198—27 **4 Claims**



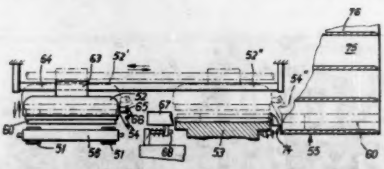
Apparatus for accumulating bars provided with a high finish. The finished bars are advanced on a linear series of guide rolls to a transfer position. Transfer means is power operated over an arcuate path to elevate a bar from the guide rolls, move it laterally and deposit the bar on a series of conveyors. The conveyors extend laterally from the series of guide rolls and are power operated, prior to the disposition of a bar thereon, to move the accumulated bars on a conveyor in a direction away from the guide rolls. The bars are handled without any sliding movement on the components of the apparatus.

3,567,004

METHOD AND APPARATUS FOR FORMING BLOCKS OF CIGARETTES OR THE LIKE

Peter Hess, Hamburg-Lohbruegge; Bernhard Schubert, Neu-Bornsen, and Dietrich Bardenhagen, Hamburg-Lohbruegge, Germany, assignors to Hauni-Werke, Korber & Co. KG., Hamburg-Bergedorf, Germany

Filed July 15, 1968, Ser. No. 745,006
Claims priority, application Germany, July 20, 1967, H63330
Int. Cl. B65b *19/04;* **B65g** *47/26*
U.S. Cl. 198—31 **23 Claims**

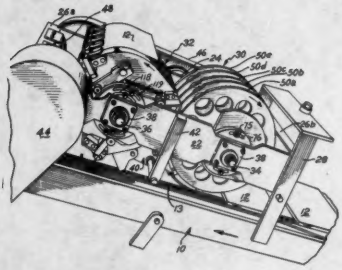


Blocks of cigarettes are assembled by feeding cigarettes sideways from one or more rod cigarette machines to a collecting station where the cigarettes are assembled into rows of equidistant cigarettes and are thereupon transferred to a subdividing station provided with means for breaking up each row into several layers by moving portions of a row in directions at right angles to the axes of cigarettes. The resulting layers are moved axially to a stacking station where they form blocks consisting of two or more superimposed layers of cigarettes.

3,567,005
TURNOVER DEVICE

Harry M. Johnson, Urbandale, Iowa, assignor to Meredith Corporation, Des Moines, Iowa

Filed Nov. 29, 1968, Ser. No. 780,155
Int. Cl. B65g 47/24
U.S. Cl. 198—33 8 Claims

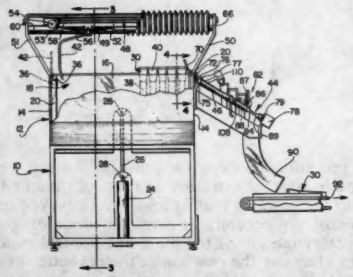


A turnover device for magazines and the like which may be mounted on an existing magazine conveyor. The device includes a mounting frame with a pusher assembly adapted to push magazines into position for gripping by a clamp cylinder also mounted on the frame. The clamp cylinder rotates counter to the direction of conveyor travel. Magazines are gripped and rotated by the clamp cylinder to effect turnover. The magazines are then released onto the conveyor for further travel. The pusher assembly and the clamp cylinder are both cam actuated.

3,567,006
BOBBIN ORIENTING AND FEEDING

Charles C. Bell, Warwick, and Frank C. Di Mauro, Providence, R.I., assignors to Leesona Corporation, Warwick, R.I.

Filed Jan. 6, 1969, Ser. No. 789,283
Int. Cl. B65g 47/24
U.S. Cl. 198—33 11 Claims

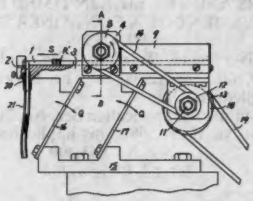


Bobbin handling apparatus in which bobbins are stored in random orientation in a hopper and are delivered by the apparatus in an oriented manner. The bobbins in the hopper are agitated by a member movable vertically through the hopper. This member has an upwardly open mouth and upon upward movement of the member the mouth receives small ends of a portion of the bobbins in the hopper with large ends of the bobbins resting on the member adjacent the mouth. A pusher is provided for moving the bobbins to one end of the mouth from which they are received between a pair of downwardly inclined rods rotated in opposite directions so as to lift the bobbins and permit them to move down the rods to an escapement. When a bobbin is required, the escapement opens to permit a bobbin to be discharged through a chute to a conveyor belt with the bobbins oriented on the belt with smaller ends leading.

3,567,007
APPARATUS FOR ALIGNING AND CONVEYING RIVETS, SCREWS, BOLTS AND THE LIKE

Akira Maeda, Iwata, Japan, assignor to The Toyo Bearing Manufacturing Company Limited, Osaka, Japan

Filed Sept. 11, 1968, Ser. No. 759,060
Int. Cl. B65g 47/24
U.S. Cl. 198—33 2 Claims

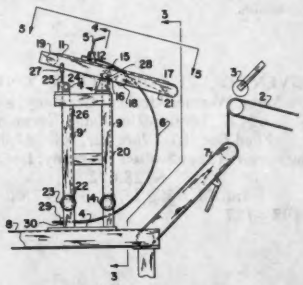


A method and apparatus for aligning and conveying small articles such as rivets, bolts, screws and the like. A table is mounted on a frame for reciprocable movement in a generally horizontal direction, said table having a plurality of longitudinally extending grooves therein adapted to receive at least a part of the articles being aligned and conveyed in the desired position. A roller is rotatably mounted above said table with the axis of rotation extending across said grooves with the surface of said roller being spaced from the grooved surface of said table a distance such that only articles properly positioned in said grooves can pass beneath said roller. While the table is reciprocated to move the articles in the spaced direction, said roller is rotated with the peripheral surface of the roller adjacent the grooved surface of the table moving in a direction opposite to the desired conveying direction to impell articles not in the grooves backwards on the table.

3,567,008
BLANK TURNING APPARATUS

Heinz B. Fischer, Covington, Va., assignor to Westvaco Corporation, New York, N.Y.

Filed Feb. 11, 1969, Ser. No. 798,353
Int. Cl. B65g 47/24
U.S. Cl. 198—33 10 Claims



Apparatus for reversing a box blank after it has been treated, e.g., coated, on one side so that it may then be treated on its reverse side. The apparatus includes a roller, positioned adjacent the downstream end of a conveyor carrying the blank from the first coater, which cooperates with the conveyor to grip the blank on both sides and propel it against a flat plate stop member. After striking the stop member the blank is allowed to fall downwardly against a curved pivot plate member which curves downwardly from the flat plate member and outwardly toward a second conveyor which extends downwardly from the first conveyor. As the blank falls against the pivot plate member its end opposite the end which struck stop member begins pivoting downwardly until it strikes the second conveyor and, through frictional engage-

ment of this end with a second conveyor and engagement of the intermediate portion of the blank with a curved plate member, the blank is pivoted so that it is dropped on a third conveyor with its sides and ends reversed from its position on the first conveyor.

3,567,009

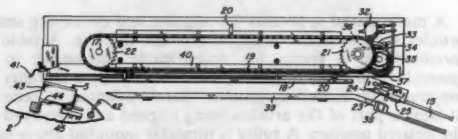
METERING MEANS FOR TRANSFERRING CONTAINERS AND THE LIKE IN TIMED RELATION TO THE MOVEMENT OF A CONTAINER RECEIVING MEANS

James H. Shiverdecker, Trenton, Ohio, and August Kund, Glendale, Calif., assignors to The Bergstein Packaging Trust, Middletown, Ohio

Continuation-in-part of application Ser. No. 701,782, Jan. 30, 1968, Patent No. 3,491,508. This application Oct. 2, 1969, Ser. No. 863,300

Int. Cl. B65g *47/30*

U.S. Cl. 198—34 **3 Claims**



A metering means for transferring containers and the like from a conveyor or other delivery means in predetermined timed relation to a moving container receiving means, the metering means comprising a pivotally mounted elongated arm having a container engaging finger at one end and a container contacting pad at the other, the arm being movable from a first position in which the finger engages the leading end of a first container advancing along the delivery means and arrests its forward movement to a second position in which the finger is retracted to free the first container for transfer to the container receiving means and the pad engages the next succeeding container moving along the delivery means to temporarily arrest its forward movement and thereby prevent more than one container from being released upon movement of the arm from its first to its second position, the arm being movable from one position to the other in timed relation to the movement of the container receiving means.

3,567,010

DRIVEN ROLLER FOR ROLLER CONVEYORS

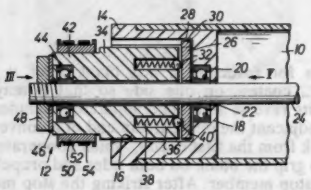
Hans Vom Stein, Wermeslkirchen, Germany, assignor to Hans vom Stein o.H.G., Dhunn-Rhineland, Germany

Filed Dec. 16, 1968, Ser. No. 784,004

Claims priority, application Germany, Dec. 21, 1967, ST28,692

Int. Cl. B65g *13/02*; **F16d** *7/00*

U.S. Cl. 198—127 **17 Claims**



thus rotate the shell by way of the cap. The balls are expelled from the sockets in response to application of a predetermined force which tends to rotate the sleeve with reference to the cap or vice versa.

3,567,011

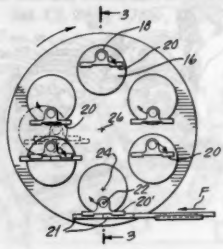
CIGARETTE TRANSFER APPARATUS FOR CHANGING DIRECTION AND REDUCING VELOCITY OF CIGARETTES

Jesse R. Pinkham, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Oct. 18, 1968, Ser. No. 768,844

Int. Cl. B65g *29/00*

U.S. Cl. 198—211 **3 Claims**



A transfer device useful for filter or cigarette rod-forming machines employing an epicycloidal motion to transfer cigarettes moving at a high axial velocity in a cigarette making machine to a conveyor moving at a lower velocity in a transverse direction while providing a graduated transition from one velocity to the other to eliminate damage to the cigarettes due to impact at the transition of speed and direction.

3,567,012

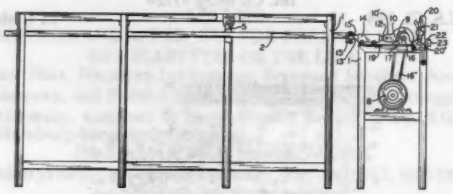
CONVEYING APPARATUS

Fausto Celorio Mendoza, Cumbres de Acultzingo No. 185, Lomas de Chapultepec, Mexico City 10, Mexico

Filed Sept. 16, 1968, Ser. No. 762,257

Int. Cl. B65g *27/32*

U.S. Cl. 198—220 **4 Claims**



This invention concerns a conveyor having a moveable plate and in which a vibratory or reciprocating motion is imparted to the plate so that articles are conveyed on the surface thereof. An eccentric is driven by a motor to cause the reciprocatory motion of the plate and control means is provided for changing the position of the eccentric to adjust the speed and direction of motion of articles on the conveyor plate.

3,567,013

SELF-ENCLOSING BLISTER PACKAGE

Michael A. Tannenbaum, Brooklyn, N.Y., assignor to E. L. Squibb & Sons, Inc., New YORK, N.Y.

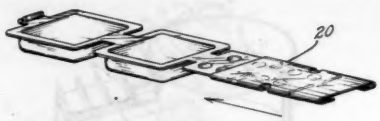
Filed Dec. 5, 1967, Ser. No. 688,104

Int. Cl. B65d *83/04*

U.S. Cl. 206—42 **3 Claims**

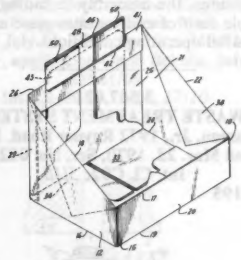
This application relates to a unitary blister package whereby a primary blister pack and a secondary or outer pack are formed both at the same time in one continuous piece and folded to form an inner blister pack and an integral outer package. By means of the present invention, the production of completed packages may be achieved using basic blister forming equipment. Labor requirements for

secondary packaging are eliminated since the packages of the invention may be produced on intermittent or continuous



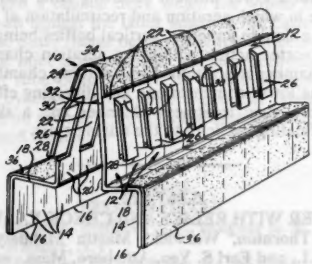
blister form fill and seal equipment and inventories of secondary packaging components are no longer required as they can be formed as needed.

3,567,014
TRAY FOR SHIPPING AND DISPLAYING MERCHANDISE
Paul Feigelman, Elmhurst, N.Y., assignor to The Churchill Company, Inc.
Filed May 9, 1969, Ser. No. 823,273
Int. Cl. B65d *5/50*
U.S. Cl. 206—44 **10 Claims**



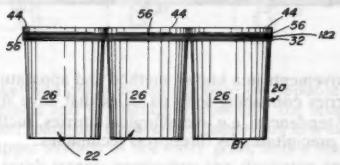
Open-topped tray has flap hinged to upper edge of its rear wall, flap being folded down parallel to face of rear wall. Slot extends along hinge line. A display slide is arranged between the flap and rear wall, and in shipping position a portion of the slide projects through the slot. Slide movable upwardly to display position wherein its lower margin is sandwiched between the flap and rear wall to maintain the slide erect.

3,567,015
CLINCHABLE SNAP LOCK FASTENER PACKAGE
Edward A. Colechia, East Greenwich, R.I., assignor to Textron Inc., Providence, R.I.
Filed Oct. 1, 1969, Ser. No. 862,778
Int. Cl. F16b *15/08*
U.S. Cl. 206—56 **7 Claims**



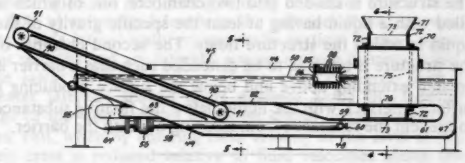
A fastener stick package comprising a plurality of separate similarly constructed fasteners cemented together in row formation in which each fastener includes a pair of clinchable work penetrating leg portions and a pair of centrally located converging arm portions integrally interconnected at their converging ends by a tip portion and at their opposite ends with relatively short, generally parallel aperture engaging portions integrally interconnected with the leg portions by transversely extending connecting portions, the arm portions having fingers struck therefrom which are integrally joined at one end adjacent the tip portion and extend therefrom to free ends adapted to engage the adjacent surface of an apertured workpiece in which the aperture wall engaging portions are engaged.

3,567,016
CONTAINER AND CLOSURE THEREFOR
Ralph V. Bardell, Homewood, Ill., assignor to Growth International Industries Corp.
Original application Dec. 3, 1968, Ser. No. 780,718, now Patent No. 3,519,163, dated July 7, 1970. Divided and this application July 16, 1969, Ser. No. 850,302
Int. Cl. B65d *71/00*
U.S. Cl. 206—65 **1 Claim**



A plastic closure adapted for application to an open head container body comprises a perimetral inverted U-shaped channel provided at the periphery thereof, with the channel being formed by an inner flange, outer flange, and an integral interconnecting top section. Interlocking means, provided on the interior of the outer flange, are adapted to engage the sidewall structure of the container body. Means are provided for separating the lower portion of the outer flange into separate sections in order to facilitate disengagement of the closure, with such means preferably taking the form of at least one vertical tear line severable with a screwdriver or the like.

3,567,017
FLOTATION SEPARATING APPARATUS AND METHOD
Robert L. Hughes, 207 Lane St., Modesto, Calif.; Robert J. Allen, Forest Hills Apartments 23B 31 Golden Ave., Battle Creek, Mich.; Donald A. Barnes, 1678 W. Service Road, Modesto, Calif., and Donald A. Bratsch, 136 Elliot Place, Walla Walla, Wash.
Filed Aug. 3, 1967, Ser. No. 658,120
Int. Cl. B03b *3/30*; **B03d** *1/00*
U.S. Cl. 209—156 **5 Claims**



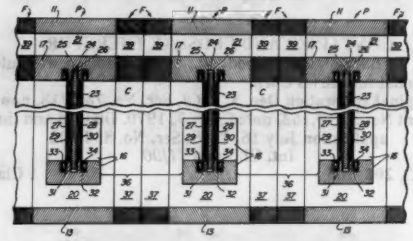
A flotation separator containing a liquid circulating in a laminar flowing stream receives a mixture of intermingled fractions of a vegetable product introduced therein from a conveyor running in a direction transverse to the direction of flow and beneath the surface of said stream. Separate fractions are collected from the surface of said stream at separate locations downstream from their point of introduction, and any fraction remaining on said conveyor after exposure to said stream is collected at a point remote from said stream.

3,567,018

METHOD AND APPARATUS FOR FILTERING SLURRIES CONTAINING SOLID PARTICLES HAVING INTERLOCKING TENDENCIES

Arthur M. Moler, Salt Lake City, Utah, assignor to Kennecott Copper Corporation, New York City, N.Y.

Filed Feb. 10, 1969, Ser. No. 797,828
Int. Cl. B01d 25/12
U.S. Cl. 210—67 6 Claims



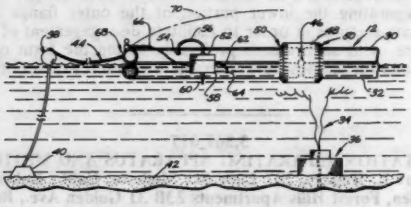
Improvements in a known method and apparatus for filtering slurries containing solid particles that have strong interlocking tendencies, e.g. metallurgical slurries, such as cement copper precipitates, by filter press techniques.

3,567,019

OIL LEAKAGE BARRIER

Edward E. Headrick, 4900 Crown Ave., La Canada, Calif.

Filed Mar. 18, 1969, Ser. No. 808,287
Int. Cl. E02b 15/04; C02c 01/38
U.S. Cl. 210—87 4 Claims



A light weight, elongated, flexible, tubular structure is provided for use in confining leaking oil and other lighter-than-water substances to a predetermined area. At an offshore location the ends of the structure are drawn together to create a closed figure surrounding the point where oil is surfacing. The structure is divided into two chambers, one of which is filled with a liquid having at least the specific gravity of the liquid in which the structure floats. The second chamber of the structure is adapted to be distended such that a barrier is created extending above and below the surface producing a surface interlock with the liquid below the floating substance to prevent the substance from shipping beneath the barrier.

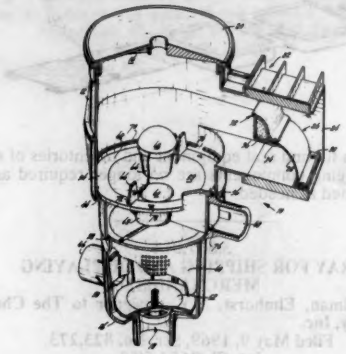
3,567,020

POOL SKIMMER

Brackston T. Whitaker, Tucson, Ariz., and William O. Baker, Huntington Beach, Calif.

Filed May 28, 1969, Ser. No. 828,594
Int. Cl. B01d 23/00
U.S. Cl. 210—94 11 Claims

A pool skimmer and the like including a skimmer assembly adapted for use with residential and commercial installations with means for selectively operatively connecting various lines and apparatus in a system for liquid surface skimming, vacuuming and liquid draining having means for cleaning and filtering pool liquid for reuse thereof, wherein means are provided for simplifying establishing all necessary conduit connections for main outlet plumbing, skimmer plumbing and vacuum connections, the assembly including selectively usable and operable control and vacuum plate and float stopper to establish desired operating conditions.

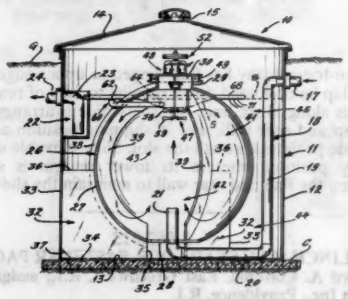


3,567,021

WASTE TREATMENT SYSTEM

Daniel P. Morisseau, Jr., 1972 Rayner Road, Kirkwood, Mo.

Filed Mar. 25, 1970, Ser. No. 022,500
Int. Cl. C02c 5/10
U.S. Cl. 210—195 15 Claims



A waste treatment system having a spherical aeration chamber with a lower influent receiving zone and an upper mixing zone in which aeration and recirculation of influent is effected by a double impellor, vertical baffles being provided to prevent vortex action within the aeration chamber. The spherical chamber is positioned in a settling chamber having baffles in the lower compartment, and diverging effluent outlet pipes to a final treatment chamber and a skimmer to return any floating particles to the mixing zone.

3,567,022

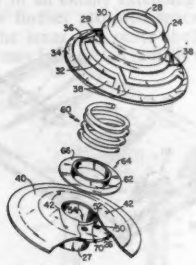
FILTER WITH RELIEF AND CHECK VALVES

Donald I. Thornton, Warwick; Martin Mahdesyan, Pawtucket, R.I., and Earl S. Yeo, Attleboro, Mass., assignors to Fram Corporation, Providence, R.I.

Filed May 26, 1969, Ser. No. 827,861
Int. Cl. B01d 35/14, 27/10
U.S. Cl. 210—130 5 Claims

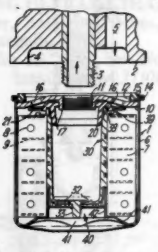
Relief valve in a filter, with a seating surface adjacent an opening in the valve seat, and a flexible valve member having

a portion fixed and sealed relative to the seat on the side of the opening opposite the seating surface, the flexible member



being resiliently biased against the seating surface at its free portion.

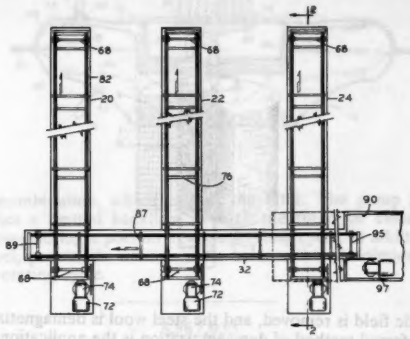
3,567,023
VALVED FILTER SUPPORT TUBE
Kenneth Ernest Buckman, Winsor, near Woodlands, and Derrick Percival Tuffnell, Southampton, England, assignors to General Motors Corporation, Detroit, Mich.
Filed July 11, 1969, Ser. No. 840,913
Claims priority, application Great Britain, July 13, 1968, 33541/68
Int. Cl. B01d *35/14, 27/10*
U.S. Cl. 210—130 **7 Claims**



In a liquid filter, particularly an internal combustion engine oil filter, a plastics support tube, externally grooved to provide drainage channels, fits within one end of the element and has a projecting castellated portion and a flange which seals against said one end of the element, whilst a combined annular seal and relief valve member of elastomeric material has an outer flange which normally overlies inlet openings in an end plate of the filter casing, an inner peripheral portion sealed to the end plate around a central outlet opening in the end plate, and a coaxial neck which fits within the support tube and seals against the latter adjacent the castellated portion, the said outer flange being resiliently deflected by liquid entering the inlet openings and the seal between the neck and support tube being broken, to permit a bypass flow of liquid directly between the inlet and outlet openings when the pressure on the neck, through the castellations, exceeds a predetermined value.

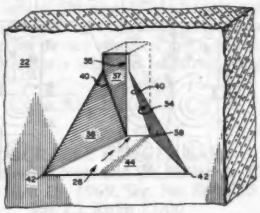
3,567,024
TRENCH FILTER
Carl R. Mc Cormick, Penfield, N.Y., assignor to M. J. French Co., Inc., Webster, N.Y.
Filed Aug. 25, 1969, Ser. No. 852,846
Int. Cl. B01d *35/16, 29/42*
U.S. Cl. 210—164 **6 Claims**

Industrial waste system having lateral lined trenches in a floor comprising spaced parallel side plates with downwardly and inwardly inclined lower sections joined to form a V bottom having a lengthwise gradient sufficient to promote flow of liquids and matter capable of suspension in the liquid from one end to a discharge point at the other end, side wall shoulders for supporting the side plates within the trench with the upper edges of the plates close to floor level, internal filter-grid support shoulders extending horizontally along the inside walls below floor level having filter grids thereon, power



driven sprocket and chain means disposed on opposite sides of the side plates and extending substantially the length of the trench liner, carrying transverse scraper bars at a level to scrape the upper surface of the filter grids, and a similarly constructed trunk trench connecting the discharge ends of the lateral trenches, and means for collecting the liquids separate from the waste collected by the scraper bars.

3,567,025
SKIMMING WEIR
Edward F. Gillette, Greenwich, Conn. (737 Canal St., Bldg. 16, Stamford, Conn. 06902)
Continuation-in-part of application Ser. No. 718,467, Apr. 3, 1968, now abandoned. This application Dec. 8, 1969, Ser. No. 883,071
Int. Cl. B01d *21/24*
U.S. Cl. 210—169 **5 Claims**

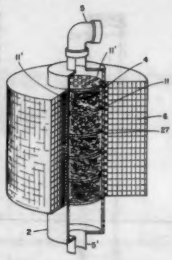


A broad crested weir with a converging trapezoidal entrance region, for maximizing velocity of surface flow relative to flow at submerged levels in the adjacent fluid reservoir. The weir's lateral walls are generally vertical in their upper rear sections and are laterally spaced a given distance apart. The lower forward sections of the walls converge from a greater laterally spaced apart distance along the forward edge of the weir crest to the given lateral distance near the weir exit, whereby entering fluid velocity at the level of the weir crest is reduced relative to fluid velocities above the weir crest.

3,567,026
MAGNETIC DEVICE
Henry H. Kolm, Weir Meadow, Wayland, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.
Filed Sept. 20, 1968, Ser. No. 761,048
Int. Cl. B01d *35/06*
U.S. Cl. 210—222 **4 Claims**

Apparatus for separating colloidal and subcolloidal ceramic magnetic components from a slurry by passing the slurry

through a column containing a magnetic material, as a magnetic grade stainless steel wool. The steel wool is subjected to a DC magnetic field to effect magnetization thereof and provides a large number of regions of very high magnetic field gradient along the paths of travel of the slurry to attract and retain the magnetic components. At intervals, the DC magnetic field is removed, and the steel wool is demagnetized. A preferred method of demagnetization is the application of an AC magnetic field, upon removal of the DC field, the AC field being gradually reduced to zero. Eddy current means is provided to apply an eddy current field to the steel wool to shake the components from said regions of the steel wool during the intervals.



3,567,027

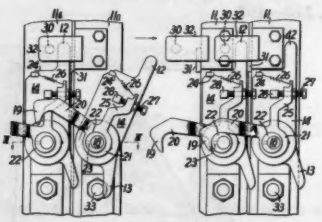
APPARATUS FOR RELEASING AND COUPLING FILTER PLATES IN A FILTER PRESS

Ken-Ichiro Kurita, Suita, Japan, assignor to Kurita Machinery Manufacturing Company Limited, Osaka, Japan

Original application Dec. 3, 1968, Ser. No. 780,723. Divided and this application Mar. 6, 1970, Ser. No. 17,153

Int. Cl. B01d *25/12*

U.S. Cl. 210—230 **4 Claims**



Each of the filter plates is provided on opposite sides with stud members and actuating members having hook members pivotally mounted on the outer sides thereof and associated therewith. The hook portions of the hook members on a filter plate are adapted to be engaged with stud members on the following adjacent filter plate in the order of separation. Actuating pins to cooperate with the protrusions in the upper portions of the actuating members are provided on the preceding adjacent filter plate. When the preceding plate is released, the actuating members and hook members on the following filter plate adjacent to the preceding plate are forced to function to make the following plate ready for separation.

3,567,028

MEMBRANE ENVELOPE ASSEMBLY

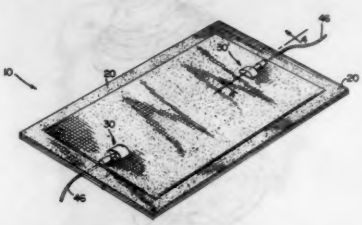
Yukihiko Nose, Cleveland Heights, Ohio, assignor to Research Corporation, New York, N.Y.

Filed Dec. 26, 1968, Ser. No. 787,054

Int. Cl. B01d *31/00, 13/00*

U.S. Cl. 210—232 **7 Claims**

A sterile, relatively inexpensive, disposable membrane envelope assembly is provided with the assembly consisting of a pair of spaced opposed extended surface membranes sealed together, a pair of porous reinforcing sheets at the obverse surfaces of the membranes adhesively secured to the membranes, and fluid inlet and outlet nipples mounted at opposite



edges of the membranes to direct fluid flow between the opposed surface membranes. Membrane envelopes resulting from both total surface adherence of the reinforcing sheets to the membranes, and peripheral adherence of the reinforcing sheets to the membranes are disclosed.

3,567,029

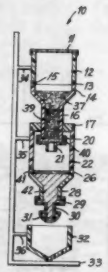
COLUMN FOR TESTING BIOLOGICAL FLUIDS

Babington A. Quame, 235 E. 18th St., New York, N.Y. 10003

Filed Aug. 26, 1969, Ser. No. 853,066

Int. Cl. B01d *25/06, 27/02*

U.S. Cl. 210—249 **7 Claims**



A column for testing biological fluids. The column includes an upper receiving container for receiving the fluid which is to be tested. The bottom end of the fluid receiving container is open and situated just beneath a fritted glass disc on which there is a body of resin particles, and on the latter body of resin particles there is a body of purified cellulose, so that in this way there will result a maximum adsorption of drugs together with the resin from a biological fluid. Beneath the fluid receiving container is a filtration container having at its upper region an opening communicating with the outer atmosphere so as to release any pressure which otherwise would build up within the filtration container. Within the filtration container is a filtering aid covered with a phase separating paper. Beneath the filtration container, which has a bottom end, is a collecting container which will collect clear organic solvent with pure drugs contained therein, in the case where the column is used for drug abuse testing purposes. The top open end of the receiving container and the bottom open end of the filtration container can be covered with removable closing caps so that the column can be conveniently sent through the mails, for example.

3,567,030

REVERSE OSMOSIS APPARATUS

Robert I. Loeffler, 1200 Caddell, and Harold M. Bradbury, 1217 W. Brooks, Norman, Okla. 73069

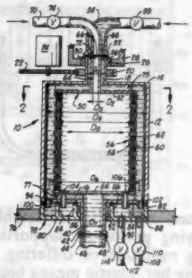
Filed Nov. 29, 1968, Ser. No. 780,123

Int. Cl. B01d *13/00*

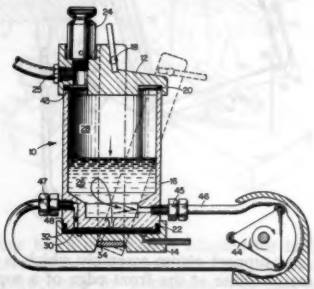
U.S. Cl. 210—321 **6 Claims**

Apparatus for carrying out reverse osmosis to separate materials, the apparatus including an outer shell and an inner

shell mounted inside the outer shell for rotation of the shells about a common axis. The inner shell includes a permeable osmotic membrane at its outer periphery which is located radially inwardly of an axially extending space between the shells. There are further provided spaces between the opposed ends of the inner and outer shells through which a process solution may be directed radially to and from the axially extending space. A conduit and fluid flow passageway system is provided for removing product liquid from a point immediately radially inward of the membrane and at one end of the inner shell whereby when the shells are rotated about a common axis, a pressure differential is developed across the membrane in which the lower pressure is on the radially inner side of the membrane.



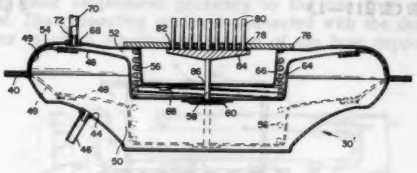
3,567,031
AUTOAGITATING ULTRAFILTRATION APPARATUS
Herbert H. Loeffler, Arlington, Mass., assignor to Amicon Corporation, Lexington, Mass.
Filed May 29, 1969, Ser. No. 828,936
Int. Cl. B01d *31/00*
U.S. Cl. 210—321 **8 Claims**



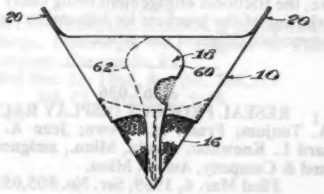
Ultrafiltration apparatus of the thin-channel type comprising a flow-directing means and a reservoir for fluid. The flow-directing means is advantageously in a spiral form so that it may impart a mixing action to fluid passed therefrom into the reservoir.

3,567,032
FILTER AND PUMP FOR A RECIRCULATING SANITARY SYSTEM
James M. Kemper, Hollywood, Calif., assignor to Monogram Industries, Inc., Los Angeles, Calif.
Continuation-in-part of application Ser. No. 737,232, June 14, 1968, now abandoned. This application June 2, 1969, Ser. No. 829,486
Int. Cl. B01d *29/38*
U.S. Cl. 210—355 **6 Claims**

In a recirculating sanitary system, an improved filter and pump assembly provides a source of flushing liquid. A diaphragm pump is provided with a coupling to a plurality of needle members that reciprocate through an apertured plate. The needle members extend beyond the plate into the storage tank at all times, and the reciprocating motion imparted to the needle members tends to clean the needle-aperture combination, which acts as the filter. The pump also supplies a limited backflow through the filter for cleaning purposes during a portion of the operating cycle. In addition, a novel, pneumatic timing device assures the completion of an operating cycle.

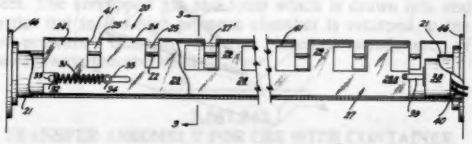


3,567,033
DISPOSABLE FILTERING DEVICE
James P. Whelan, Pembroke, Mass., assignor to Ad-Tec Products, Inc., North Quincy, Mass.
Filed Oct. 11, 1967, Ser. No. 674,624
Int. Cl. B01j *23/28*
U.S. Cl. 210—497 **2 Claims**



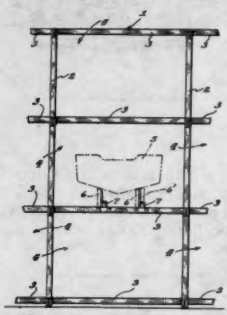
A disposable conical filtering device having gauze covered openings is characterized by structure providing a more rigid and efficient filtering device which is more convenient in use and which is particularly adapted for straining paint or the like.

3,567,034
LOCKABLE HANGER BAR
Salomon Mozelsio, 1624 Nutwood St., Fullerton, Calif.
Filed Nov. 28, 1969, Ser. No. 880,723
Int. Cl. E05b *73/00*
U.S. Cl. 211—7 **10 Claims**



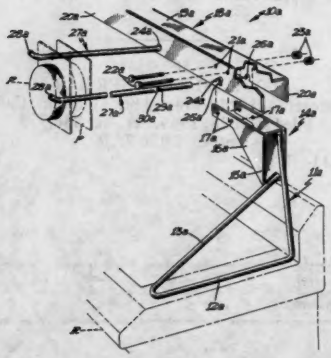
A lockable hanger bar comprises an elongate tubular bar adapted to hold a plurality of garment hangers in the crenels between hollow projections extending upwardly from the bar. A unitary, substantially planar locking member is moveably disposed entirely within the bar. The locking member includes a plurality of inverted L-shaped extensions which in an open position are hidden in the projections. In a closed position, the top part of each extension extends across an associated crenel between two projections so as to lock a hanger retained in the crenel.

3,567,035
BOAT RACK
Leonard J. Dudzik, Dolton, Ill., assignor to Interlake Steel Corporation, Chicago, Ill.
Filed Nov. 20, 1968, Ser. No. 777,232
Int. Cl. B63c 15/00
U.S. Cl. 211—13 3 Claims



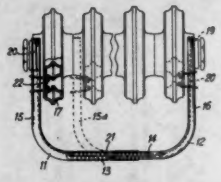
A support structure for storage of boats and like articles in the form of a rack structure with defined openings in which the articles are stored. Brackets are provided in the openings for supporting horizontal beams which directly support the articles. The brackets have fastening means for frictionally engaging the rack structure to secure the brackets to the rack structure, the frictional engagement being easily releasable to permit shifting of the brackets for adjustable bracket spacing to accommodate different size articles.

3,567,036
RESEAL PRODUCT DISPLAY RACK
John A. Tonjum; Frank M. Brown; Jean A. Burton, and Richard L. Knowlton, Austin, Minn., assignors to Geo. A. Hormel & Company, Austin, Minn.
Filed Mar. 6, 1969, Ser. No. 805,053
Int. Cl. A47f 7/00
U.S. Cl. 211—57 1 Claim



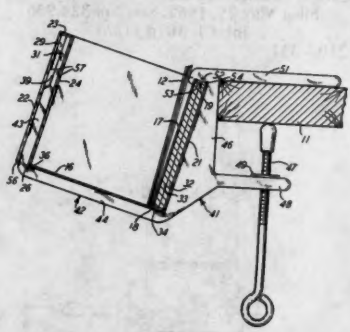
A display device for supporting a plurality of packaged food products includes an elongate mounting member having a pair of flanges, each flange having a plurality of openings therein. The openings in one of the flanges is of keyhole configuration, and one opening in one flange is aligned with an opening in the other flange. A plurality of elongate similar support members each engages in a pair of openings in said mounting member. Each support member has a recess therein seated in the smaller portion of a keyhole opening and coacting therewith to prevent rotation of the support member about its longitudinal axis.

3,567,037
TELESCOPIC SUPPORTS
Marie-Claire Balencon, Muret-Haute-Garonne, France
Filed June 20, 1968, Ser. No. 738,628
Claims priority, application France, June 23, 1967, P.V.111,672
Int. Cl. A47k 10/10
U.S. Cl. 211—86 1 Claim



There is disclosed herein an adjustable support, for instance for displaying goods or supporting towels next to household heating radiators of differing lengths, which includes a telescoping bar, elastic means biasing the bar toward longitudinal extension or retraction and clips movable along the bar which are engageable with spaced points on a fixed support, for instance with spaced heating elements on the heating radiator or adjust the distance between the bar and the fixed support.

3,567,038
BIN AND SUPPORT CLAMP ASSEMBLY
Roy C. Ammann, Racine, Wis., assignor to Western Publishing Company, Inc., Racine, Wis.
Filed Sept. 3, 1969, Ser. No. 854,985
Int. Cl. A47f 5/08
U.S. Cl. 211—88 7 Claims

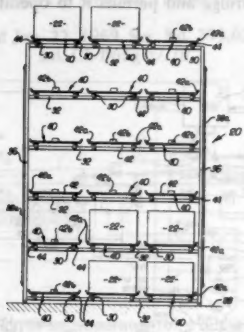


A bin and support clamp assembly which is useful in displaying merchandise at the front edge of a support shelf or the like. The bin portion includes a front wall and a rear wall and a bottom, all preferably made from cardboard material. The clamp portion includes a U-shaped leg which extends along the three portions of the bin to securely hold the bin. The clamp also includes a fastening portion for attaching the entire assembly to a support shelf or the like, and the fastening portion and the U-shaped leg are relatively oriented so that the bin is tilted or oblique to the horizontal position of the shelf, for optimum support and display of the merchandise.

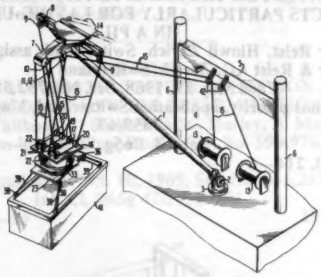
3,567,039
ELEVATOR CONVEYOR AND STORAGE RACK SYSTEM
George Q. Evans, 204 S. Locust St., Compton, Calif.
Original application Feb. 7, 1967, Ser. No. 614,430, now Patent No. 3,455,469, dated July 15, 1969. Divided and this application Aug. 5, 1968, Ser. No. 761,383
Int. Cl. A47f 5/00; A61g 17/00
U.S. Cl. 211—162 5 Claims

A system for storing articles in a rack having a plurality of shelves and removing them therefrom using a movable and

adjustably elevated loading conveyor. The storage areas in the rack are provided with slide assemblies adapted to receive an article to be stored therein and the loading conveyor is movable to positions relative to said rack which directly align articles carried therein with storage areas in the rack so that the articles can be readily loaded and unloaded.



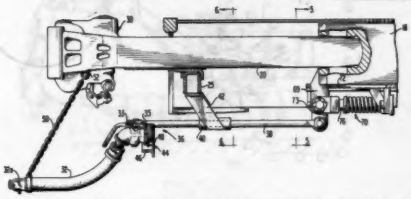
3,567,040
LUFFING AND SLEWING JIB CRANE
John S. Thomson, 104 Forsyth St., Greenock, Scotland
Filed June 10, 1968, Ser. No. 735,879
Claims priority, application Great Britain, June 9, 1967, 26844/67
Int. Cl. B66c *23/06*
U.S. Cl. 212—58 **2 Claims**



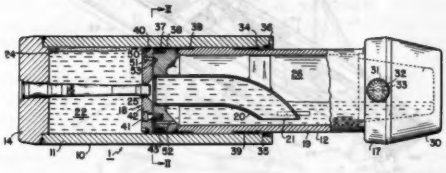
A ship's crane has a jib which is adapted for luffing and slewing movements, and from which is suspended a load-handling device, particularly for containers. The load-handling device is in two portions, with a motor to rotate the two portions relative to each other to position the load accurately. The crane has a single load cable which is reeved about the jib head and the upper of the two portions in such a way that, in addition to resisting reactionary rotation of the upper portion of the load-handling device, the device is enabled to maintain its horizontal position irrespective of the angle of elevation of the jib or list of the ship.

3,567,041
HOSE SUPPORT ASSEMBLY FOR A RAILWAY VEHICLE
Orum E. Seay, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.
Filed July 18, 1968, Ser. No. 745,874
Int. Cl. B61g *7/00*
U.S. Cl. 213—1 **1 Claim**

An assembly which is intended to support a coupling hose of a railway vehicle having a fixed sill. A draft unit mounted in the sill is of the type including a draft housing mounted for longitudinal sliding motion within the sill. A coupling bar, having one end projecting outwardly from one end of the vehicle, is connected at its other end to the draft housing for transverse swinging motion about a vertical pivot axis disposed in a longitudinal median plane of the vehicle. The coupling hose is connected at one of its ends to a hose support member. This support member is supported by connecting means in spaced vertical relation relative to the coupling bar, in close longitudinal proximity to the one free end thereof. The connecting means is connected with the draft member to cause longitudinal motion of the hose support member relative to the sill upon corresponding motion of the coupling bar. This motion of the hose support member serves to generally maintain the relative positioning of the hose support member and the free end of the coupling bar during cushioning motion thereof. Guiding means is connected with the vehicle and with the connecting means to guide the connecting means and thus move the hose support member in a path disposed generally in the longitudinal median plane of the railway vehicle.



3,567,042
PNEUMATIC-HYDRAULIC SHOCK ABSORBER
Norman J. Borgo, Pittsburgh, Pa., assignor to Pittsburgh Forgings Company, Caraopolis, Pa.
Filed Dec. 23, 1968, Ser. No. 786,259
Int. Cl. B61g *9/08, 9/16*
U.S. Cl. 213—43 **1 Claim**

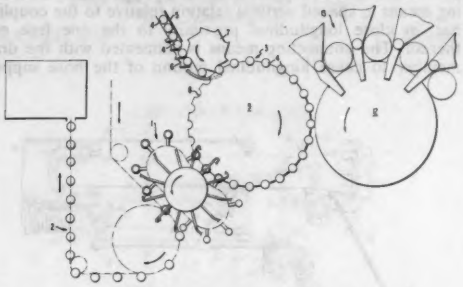


A pneumatic-hydraulic shock absorber having a high-pressure chamber formed by a cylinder and containing a liquid and a low-pressure chamber formed in the hollow portion of a piston and containing a liquid and a compressed gas. The shock is absorbed by the throttling action of a metering pin positioned in a deflector tube which connects the two chambers. The entrapped gas and foam which is drawn into and settles out in the high-pressure chamber is returned to the low-pressure chamber by an interconnected set of passageways therebetween.

3,567,043
TRANSFER ASSEMBLY FOR USE WITH CONTAINER PRINTING MACHINES
Enn Sirvet, Ridgefield; Edward J. Whelan, Hasbrouck Heights, and John P. Skrypek, Clifton, N.J., assignors to Sun Chemical Corporation, New York, N.Y.
Filed Aug. 5, 1968, Ser. No. 750,182
Int. Cl. B65g *47/34*
U.S. Cl. 214—1 **15 Claims**

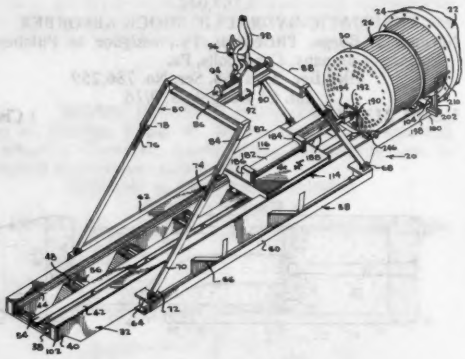
A transfer assembly for continuously removing printed cans from the mandrels of a container printing machine and placing the cans on a drying oven conveyor, the transfer assembly including a plurality of pneumatically actuated can holders mounted on an endless conveyor and laterally

reciprocable thereon, whereby each can holder is moved laterally in one direction to remove a printed can from a



mandrel, and then in the opposite direction to place the can on the drying oven conveyor.

3,567,044
APPARATUS FOR FORCE APPLICATION
Bobby J. Travis, 345 Mayhaw, Vidor, Tex.
Filed Sept. 3, 1968, Ser. No. 756,920
Int. Cl. B66f *1/00*
U.S. Cl. 214—1 **7 Claims**

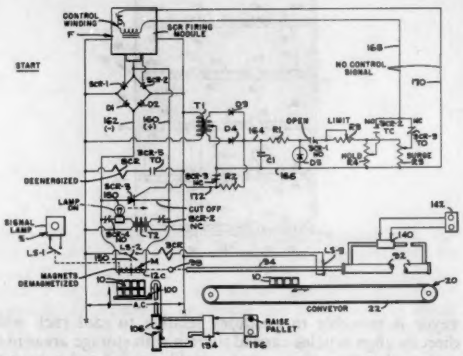


A frame has a slidably mounted skid assembly thereon with extensible and retractable cylinder means secured to the skid and to an object to which force is to be applied. The frame has sequentially spaced block means interengageable with selective dog means on the skid to restrict movement of the skid in either of two directions upon actuation of the cylinder means.

The frame is carried in a mobile support attachable to various types of prime movers.

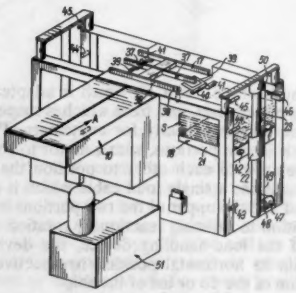
3,567,045
MAGNETIC CAN HANDLING APPARATUS WITH DEMAGNETIZATION
William G. Albright, Champaign, and Charles F. Kiser, Jr., Hoopeston, Ill., assignors to FMC Corporation, San Jose, Calif.
Filed July 28, 1969, Ser. No. 845,451
Int. Cl. B66c *1/08*
U.S. Cl. 214—1 **14 Claims**

Apparatus for transferring cans between a pallet and a conveyor picks up and deposits the cans by means of carriage mounted electromagnets. The DC source for the electromagnets is a bridge embodying silicon controlled rectifiers. A silicon controlled clamping rectifier is connected across the DC source and gated for passing current through the magnets only in the direction of the magnetic field collapsed current. When the magnets are deenergized the clamping silicon controlled rectifier is fired to short out the current generated by collapse of the magnetic field. This isolates the magnets from the rectifier bridge and permits it to operate under remote



control of the switch for energizing and deenergizing the magnets. An incandescent lamp heated by AC is connected across the magnets when the clamping silicon control rectifier is cut off. Energization of the electric lamp demagnetizes the magnets within a few cycles after the AC is applied to the lamp.

3,567,046
DEVICE FOR THE MANIPULATION OF LAMINAR OBJECTS PARTICULARLY FOR LAYING-UP THE SAME IN A PILE
Walter Reist, Hinwil Zurich, Switzerland, assignor to Ferag, Fehr & Reist AG, Zurich, Switzerland
Filed May 27, 1968, Ser. No. 732,382
Claims priority, application Switzerland, May 26, 1967, 7459/67
Int. Cl. B65g *57/10*
U.S. Cl. 214—6 **8 Claims**

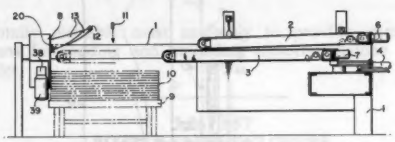


A device for handling of laminar objects, particularly for laying-out newspapers to a pile, comprises a supply grate horizontally movable to-and-fro in the direction towards and above a receiving surface for the pile and away therefrom, packages of newspapers being successively delivered on said supply grate which moves them to a position above said receiving surface, means being provided for depositing said packages of newspapers on said receiving surface upon initiation of the retracting movement of the supply grate away from said receiving surface.

3,567,047
STACKING APPARATUS FOR WOOD VENEER AND OTHER SHEET MATERIAL

Victor H. Clausen, Bellevue, and James E. Rasmussen, Seattle, Wash., assignors to Simpson Timber Company, Seattle, Wash.

Filed Jan. 22, 1969, Ser. No. 793,022
Int. Cl. B65g 57/10
U.S. Cl. 214—6 8 Claims

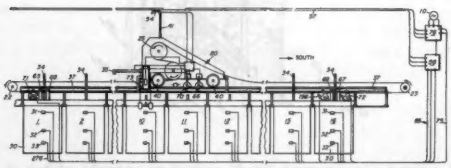


Disclosed herein is an apparatus for evenly stacking sheet material and particularly for evenly laying-up core and face sheets of wood veneer for making plywood of various thicknesses. The apparatus includes a substantially rectangular frame on which is mounted a barrier plate serving as a straight edge to align the lead edge of the veneer sheets delivered into a stacking position overlying a receiving surface, generally a conventional scissors hoist or lift. A series of spaced-apart clamping fingers project through the barrier plate, the fingers functioning to grasp and hold the lead edge of veneer delivered into engagement with them by a variable speed reciprocating conveyor. The reciprocating conveyor, after delivering the veneer to stacking position, is withdrawn from beneath the wood veneer a distance greater than the width of the veneer, thereby allowing the trailing edge of the veneer to fall to the top of the receiving surface. At substantially the same time suitable control means effect withdrawal of the clamping means to release the lead edge of the veneer held by the clamping means allowing the lead edge to fall to the top of the receiving surface.

3,567,048
REMOTE AUTOMATIC TRIPPER OPERATION AND CONTROL BY LOW BIN DETERMINATION

Latham E. Whitham, 11 Santa Rita St., Hurley, N. Mex.

Continuation-in-part of application Ser. No. 596,976, Nov. 25, 1966.
This application Oct. 10, 1969, Ser. No. 865,257
Int. Cl. B65g 47/19, 65/74
U.S. Cl. 214—16 19 Claims

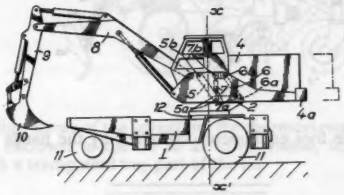


A tripper control system for regulating the flow of material from a conveyor into selected side-by-side bin locations is disclosed. The tripper is adapted to move under external program control in normal conditions to provide spot discharge of the conveyor over a predetermined low bin. The program control system includes means for periodically monitoring the level of each bin and directing the tripper to the lowest bin, where it remains until the next program cycle. A safety override responds to an overfull condition in the bin being filled to switch the tripper to self control, whereby it is moved to the next bin that is less than full and an alarm is sounded. The tripper remains in the self control mode until an operator returns it to program control or places it on manual control. In the event of control failure emergency switching shuts down the tripper and the conveyor.

3,567,049
MECHANICAL EXCAVATOR OR LOADER VEHICLE

Gabriel L. Guinot, Le Plessis-Belleville, France, assignor to Societe Anonyme Poclain, Oise, France

Filed Apr. 3, 1969, Ser. No. 813,090
Claims priority, application France, Apr. 8, 1969, 147,346
Int. Cl. E02f 3/74
U.S. Cl. 214—138 3 Claims

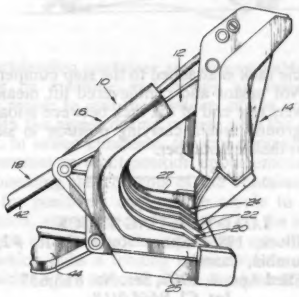


In a mechanical excavator or loader vehicle having a rotary turret carrying a counterweight, jib, and scoop or bucket the invention consists in supporting said turret on the vehicle chassis by parallel linkage means whereby said turret and the parts carried thereby can be moved bodily in a direction longitudinally of the jib to vary the position of the center gravity of the vehicle.

3,567,050
DEMOLITION SHOVEL

Henry P. Pasquazzi, and Anthony Pasquazzi, Cranston, R.I., assignors to Heather Corporation, Cranston, R.I.

Filed Apr. 22, 1968, Ser. No. 723,077
Int. Cl. B66c 1/48
U.S. Cl. 214—147 4 Claims



The invention comprises a shovel having a pair of jaws adapted to be mounted on a bulldozer or the like for operation. One of the jaws is an elongated channel member of U-shaped cross section which can be lifted and/or tilted by its connections with a bulldozer. The second jaw is pivoted along the top edge of the first jaw and has a toothed free edge adapted to cooperate with the bottom edge of the first jaw. Power cylinders cooperate between the first and second jaws to effect opening and closing relative movement.

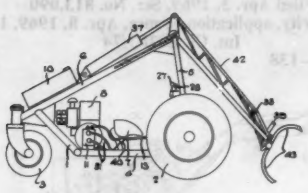
3,567,051
GREATLY MANEUVERABLE SELF-PROPELLED MACHINE

Irvine Allan Bell, Empangeni, Zululand, Natal Province, South Africa, assignor to I. A. Bell and Company (Proprietary) Limited, Natal Province, South Africa

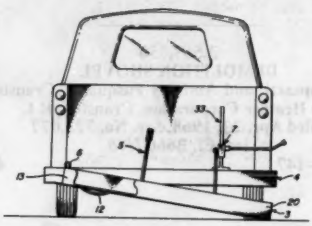
Filed Dec. 17, 1968, Ser. No. 784,409
Claims priority, application South Africa, Dec. 18, 1967, 67/7,587
Int. Cl. B62d 11/04
U.S. Cl. 214—147 7 Claims

The invention relates to a self-propelled machine of exceptional maneuverability and having power-operated tool

equipment and wherein the controls for controlling the machine movements are operated by the feet and the operations of the tool equipment controlled by the hands of the operator.

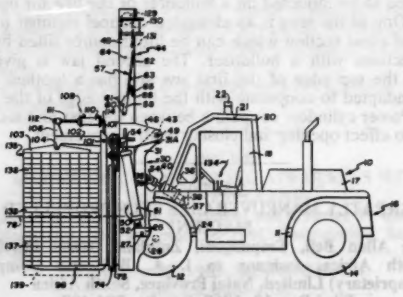


3,567,052
MOTORCYCLE CARRIER
Millard Allen, Phoenix, Ariz., and Clara Allen, Executrix
Filed Sept. 18, 1969, Ser. No. 859,120
Int. Cl. B60r 9/00
U.S. Cl. 214—450 **3 Claims**



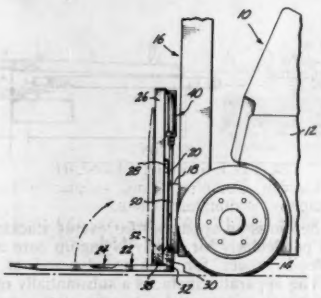
A motorcycle rack is attached to the step bumper of a road vehicle by pivot means and cantilevered lift means. A jack raises and lowers one end of the rack between a loading position on the ground and a carrying position in side-by-side relationship to the step bumper.

3,567,053
LOAD HOISTING TRUCK
Harry E. Willock, 19851 Sharp Road, R. R. #2, Langley, British Columbia, Canada
Filed Apr. 4, 1969, Ser. No. 813,637
Int. Cl. B66f 9/18
U.S. Cl. 214—652 **5 Claims**



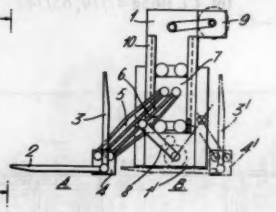
A vehicle for lifting an elongated load extending across the front of the vehicle, moving the load rearwardly above the vehicle to a position where it is approximately vertically aligned with the center of gravity of the vehicle, and finally rotating the load about a vertical axis so that it extends longitudinally of the vehicle.

3,567,054
POWER-OPERATED TILT-UP LIFT FORK
Cornelis A. Emke, Diemen, Netherlands, assignor to Cascade Corporation, Portland, Oreg.
Filed Sept. 19, 1968, Ser. No. 760,892
Int. Cl. B66f 9/10
U.S. Cl. 214—700 **5 Claims**



A lift truck with pivoted lift forks in which each lift fork has a pivot connection mounting the fork adjacent the base of a carriage in the lift truck. The pivot connection accommodates swinging of the fork between lowered and raised positions. An upright hydraulic ram disposed rearwardly of the pivot connection for the fork is provided for swinging the fork. The ram is connected to the fork through a movable link which moves to a position releasably holding the fork in its raised position on adjustment of the ram to raise the fork.

3,567,055
ARRANGEMENT OF A MOVABLE FORK OF A STACKING CRANE OR THE LIKE
Serge Preto, and Rasmus Kjolen, Bergen, Norway, assignors to Sverre Munck A/S, Bergen, Norway
Filed Oct. 14, 1968, Ser. No. 767,109
Claims priority, application Norway, Oct. 12, 1967, 170,111
Int. Cl. B66f 9/14
U.S. Cl. 214—730 **4 Claims**

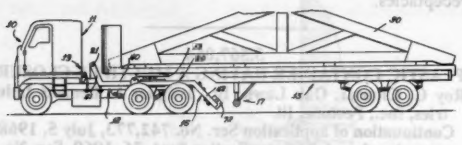


On a fork carrier of a stacking crane, a load supporting fork is movable on either side of the fork carrier between an extended position and a retracted position. Movement is directed by a parallelogram linkage connecting the fork to a linearly moving guide element on the fork carrier. Control levers connected to the fork carrier assure the movement of the fork between the two positions as the guide element moves on the fork carrier.

3,567,056
MATERIAL HANDLING APPARATUS
Marvin S. Mason, 106 S. E. 11th St., Aledo, Ill.
Filed Jan. 21, 1969, Ser. No. 792,417
Int. Cl. B66f 9/12
U.S. Cl. 214—771 **5 Claims**

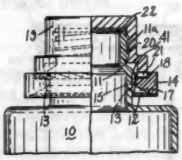
Power actuated material handling, engaging and loading apparatus, detachably mounted over the rear chassis portions of a semitrailer truck tractor, without interfering with normal

trailer hauling operations of the tractor but, capable of actuation to convert the tractor to a mobile crane and lift truck whereby load engaging means move with one end of a



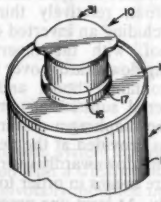
pivotally movable mast assembly to provide convenient means for loading and unloading materials hauled by the trailer.

3,567,057
BOTTLE SAFETY CLOSURE
William J. Landen, Cheshire, Conn., assignor to Eyelet Specialty Company, Wallingford, Conn.
Filed Apr. 17, 1970, Ser. No. 029,400
Int. Cl. A61j *1/00;* **B65d** *55/02*
U.S. Cl. 215—9 **12 Claims**



This disclosure relates to a safety cap for a bottle which may contain hazardous material and which is simple for an adult to open, but essentially impossible for a child of limited strength to open.

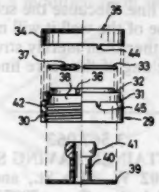
3,567,058
SAFETY CLOSURE
Carmen T. Mascia, Westchester, Ill., assignor to Continental Can Company, Inc., New York, N.Y.
Filed June 16, 1969, Ser. No. 833,541
Int. Cl. B65d *55/02, 55/12*
U.S. Cl. 215—9 **5 Claims**



A safety closure including three components having interacting means which require a combination of linear and rotary movements to open and close the closure. The closure components must be aligned in specified positions prior to changing from a linear or rotary movement.

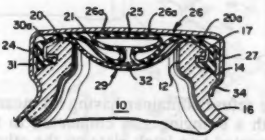
3,567,059
BABIES' BOTTLE
David Littman, Paris, France, assignor to Gebrimat Trust Reg., Vaduz, Liechtenstein
Filed Oct. 17, 1968, Ser. No. 768,268
Claims priority, application Germany, Oct. 31, 1967, Sch 43632 (utility model) 1,978,307
Int. Cl. A61j *9/02*
U.S. Cl. 215—11 **9 Claims**

The specification describes babies' bottles with thermometers mounted in their lids. In accordance with one form of the invention the thermometer is straight and extends downwards from the lid into the container. In accordance



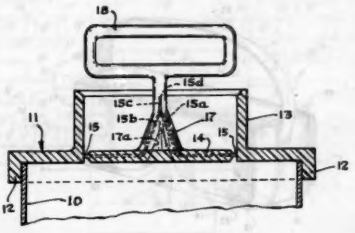
with other forms of the invention, the thermometer is arcuate and is enclosed in the lid so as to be visible, for instance, through a transparent cap part of the lid.

3,567,060
INFANT-FEEDING APPARATUS
Gene Ballin, 3045 Shore Drive, Merrick, L.I., N.Y.
Continuation-in-part of application Ser. No. 658,933, Aug. 7, 1967, now Patent No. 3,468,445, dated Sept. 23, 1969, which is a continuation-in-part of application Ser. No. 550,809, May 17, 1966, now Patent No. 3,339,771, dated Sept. 5, 1967, and a continuation-in-part of 728,191, May 10, 1968, now abandoned. This application Jan. 31, 1969, Ser. No. 801,916
Int. Cl. A61j *9/00*
U.S. Cl. 215—11 **21 Claims**



An infant-feeding container and cap assembly suitable for assembling by machine and having an insert positioned within the nipple to seal the contents of the container from contact with the nipple during storage with the cap engaging the nipple. In sealed condition, the cap depresses the nipple, which reassumes an erect position upon removal of the cap, thereby unsealing the contents of the container. Means are provided for positively causing the nipple to assume such erect position, exemplified by adhesive on the interior of the cap to assist in orienting the nipple for use or a removable member which pulls a feeding portion of the nipple into a usable position upon removal of the cap from the container.

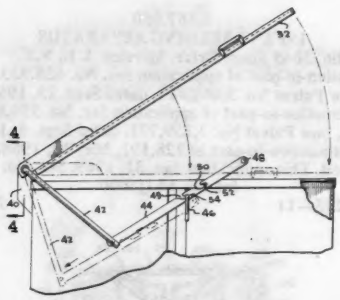
3,567,061
EASILY OPENABLE SEALED PLASTIC CLOSURE METHOD AND APPARATUS
John S. Song, 117 N. Lincoln Ave., Addison, Ill.
Filed July 8, 1969, Ser. No. 839,973
Int. Cl. B65d *17/00*
U.S. Cl. 220—27 **8 Claims**



The "score" line in a plastic wall, provided to define a line of comparatively easy tearing, is brought to a point at one

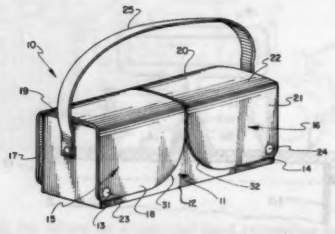
side of an abutment integral with said wall. A handle is provided on the plastic in the area within the score line and immediately adjacent the point. Pulling on the handle applies a force at which a tear will commence and continue along the score line. Because the score line comes to a point outside the plane of the wall it will more readily tend to break at that point rather than merely stretch. This tendency is enhanced by a notching of the score line at the terminus of the point.

3,567,062
REFUSE CONTAINER HAVING SAFETY LID
Lawson F. Reed, 1102 W. 11th St., and James D. Kruse, 2511 W. 11th St., Plainview, Tex. 79072
Filed Oct. 7, 1969, Ser. No. 864,435
Int. Cl. B65d *51/18*
U.S. Cl. 220—29 **10 Claims**



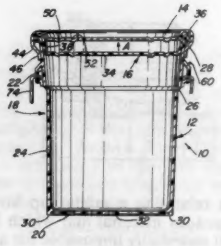
A box-type refuse container having lid means hinged to its rear wall with a swinging arm connected to the lid on one end and connected to a latch plate on the other end with the latch plate being mounted for reciprocation in a confining bracket and having slots on its upper surface which can be fitted over a portion of the confining bracket for retaining the lid in an open position so that the weight of the lid serves to latch the lid in the open position. The pivotal connection between the latch plate and the swinging arm is beneath the confining bracket so that the entire container can be pivoted about a central axis parallel to the axis of lid movement so that the lid can open as the container is rotated for emptying but will be returned to a closed position as the container is returned to its normal position. The lid is manually liftable in a normal position so that the latch plate is disengaged from the confining bracket and the lid can then consequently be closed.

3,567,063
SPLIT TOP CONTAINER
Emil Kovach, 3757 Primavera Ave., Los Angeles, Calif.
Filed Feb. 19, 1969, Ser. No. 800,519
Int. Cl. B65d *51/18*
U.S. Cl. 220—29 **1 Claim**



A container for carrying tape cartridges includes an open top box and a pair of hoods pivotally connected near the bases of opposing box ends. By slight finger pressure the hoods can be easily moved between swung-up positions where they cover the box top and swung-down positions where they uncover the box top and may serve as auxiliary receptacles.

3,567,064
PLASTIC CONTAINER HAVING A MULTIPLE CLOSURE
Roy G. Churan, Oak Lawn, Ill., assignor to Bennett Industries, Inc., Peotone, Ill.
Continuation of application Ser. No. 742,773, July 5, 1968, now abandoned. This application Sept. 26, 1969, Ser. No. 861,512
Int. Cl. B65d *41/02*
U.S. Cl. 220—29 **2 Claims**

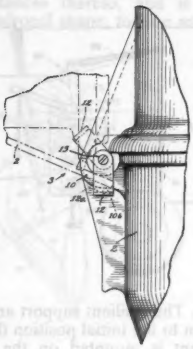


An improved closure arrangement for a molded plastic open head container for use in the shipment and/or storage of hot filled items includes an open head cylindrical plastic container body, a first, relatively thin, resilient, plastic diaphragm closure including an inverted channel provided at the periphery thereof, with the inverted channel being adapted for positioning downwardly over the periphery of the open end of the container body, and an outer closure fabricated of a material substantially more rigid than the plastic material of the diaphragm closure and including inverted channel means provided at the periphery thereof and adapted for positioning downwardly over the container body and diaphragm closure means in order to close the open end of the container body. At least one pressure release opening is provided in the outer closure, and the diaphragm inner closure means is susceptible of flexing in response to pressure differentials created within the closed container such that internal pressure changes are normalized by flexure of the diaphragm closure means, with the substantially rigid outer closure member being retained in its normal strength imparting position.

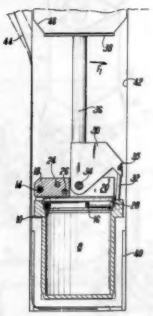
3,567,065
HINGE STRUCTURE FOR A COOKING-GRILL CONSTRUCTION
Alfred F. Dinse, Grand Prairie, Tex., assignor to Interlake Steel Corporation, Chicago, Ill.
Filed Mar. 6, 1969, Ser. No. 804,845
Int. Cl. B65d *51/10*; **A47j** *36/12*
U.S. Cl. 220—31 **4 Claims**

A cooking grill of a type having an open top-heated receptacle and a cover to enclose the open top provided with im-

proved hinge means which is separable to permit entire removal of the cover and which is held assembled by improved shiftable keeper means.



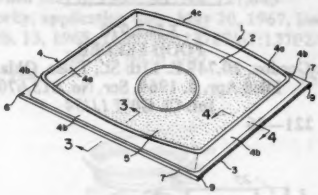
3,567,066
CONTAINER CLOSURE SYSTEM
Bernard Mansard, Saint-Cyr-L'ecole, France, assignor to Commissariat A L'Energie Atomique, Paris, France
Filed Dec. 26, 1967, Ser. No. 693,583
Claims priority, application France, Jan. 4, 1967, 89,984
Int. Cl. A47j *27/08, 36/10;* B65d *45/00*
U.S. Cl. 220—55 7 Claims



The container closure system comprises a plug with an O-ring for cooperation with a frustoconical opening of the container; the plug is pivotally mounted on an axis at right angle to that of the opening on the body and a locking member is pivotally mounted on the plug about an axis located along a diameter of the plug. The locking member is adapted to engage a resilient bracket carried by the container.

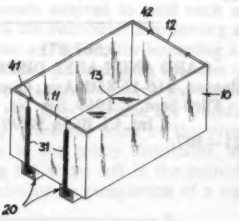
3,567,067
DISPOSABLE SERVING TRAY
Hugh R. Weiss, Montclair, N.J., assignor to The Pantasote Company of New York, Inc., New York, N.Y.
Filed Jan. 17, 1969, Ser. No. 791,952
Int. Cl. B65d *7/44, 11/22*
U.S. Cl. 220—71 9 Claims

Disposable serving trays suitable for serving snacks and dinners to airplane passengers have separately formed portions of a very thin flexible, thermoplastic sheet material shaped to that such portions may be stacked to occupy a minimal volume and are quickly stiffened to permit their use by slidably or adhesively attaching to the under surface thereof a suitable stiffening element, such as a sheet of chipboard. In one form of the invention, the stiffening member is slidably received in channels on opposite sides of the bottom of the tray and in a modified form the upper surface of the



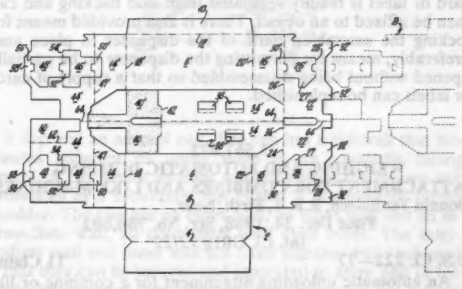
stiffening member and the lower surface of the tray are each coated with a dry, nontacky, pressure-sensitive adhesive which adheres to a similar coated surface on contact therewith.

3,567,068
COLLAPSIBLE PALLET
Joseph A. Carfizzi, Wallkill, N.Y., assignor to Collapsible Pallet, Inc., Wallkill, N.Y.
Filed Oct. 4, 1968, Ser. No. 765,256
Int. Cl. B65d *7/42*
U.S. Cl. 220—69 6 Claims



Two or more parallel legs or cleats are removably disposed at the underside of a container by means of flexible, elastic straps with extremities projecting from the ends of each cleat, these extremities being provided with hooks or other gripping formations for detachably securing them to the sides or the top of the container.

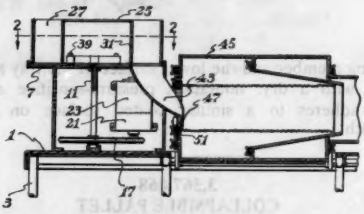
3,567,069
FULL PROTECTION BOTTLE CARRIER
Glen Ray Harrelson, Monroe, La., assignor to Olinkraft, Inc.
Filed Apr. 24, 1969, Ser. No. 818,871
Int. Cl. B65d *5/02, 5/48*
U.S. Cl. 220—113 11 Claims



A full protection basket-style bottle carrier having two pairs of riser panels of substantial longitudinal dimension,

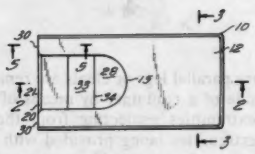
each riser panel having dimension, each riser panel having at least one lateral divider panel cut therefrom and hinged thereto to define bottle-receiving cells. The innermost edges of the riser panels are obliquely cut to form bottle separating extensions of limited vertical dimension.

3,567,070
FOOD FEEDER
Jerry D. Gordon, 10,749 E. 11th St., Tulsa, Okla.
Filed Apr. 4, 1969, Ser. No. 813,670
Int. Cl. G07f *11/54*
U.S. Cl. 221—86 **1 Claim**



A feeder for a food breader comprises a power-driven conveyor that rotates about an upright axis and that has a plurality of upright compartments for the reception of food, the compartments registering successively with a chute that feeds the breader.

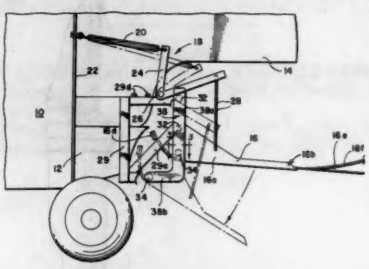
3,567,071
CARD AND LABEL DISPENSER
Gerald J. Benson, 216-16 85th Ave., Queens Village, N.Y.
Filed Sept. 4, 1969, Ser. No. 855,129
Int. Cl. B65g *59/00*
U.S. Cl. 221—307 **6 Claims**



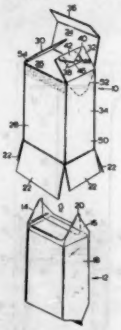
A dispenser for dispensing cards and labels is constructed such as to permit only one card or label at a time to be removed from a slot formed in the forward portion of the dispenser by means of downward finger pressure and concurrent forward finger movement. The dispenser is particularly useful for dispensing cards and labels having adhesive backings, by guiding such cards or labels through the slot and then stripping a protective backing from the card or label downwardly, generally perpendicular to the slot, so that the card or label is readily separated from said backing and can then be affixed to an object. There is also provided means for locking the assembled parts of the dispenser in place and, preferably, means for permitting the dispenser to be partially opened without being disassembled so that a supply of cards or labels can be replenished.

3,567,072
WEIGHING AND AUTOMATIC DUMPING ATTACHMENT FOR COMBINES AND LIKE MACHINES
Donald Tenhulzen, R.R. 1, Firth, Nebr.
Filed Dec. 24, 1968, Ser. No. 786,602
Int. Cl. G01g *13/22*
U.S. Cl. 222—77 **11 Claims**

An automatic unloading attachment for a combine or like machine comprises a load-receiving carrier pan which rides in a pair of fixed L-shaped tracks. A linkage mechanism provides resilient support for the carrier pan such that as the weight of the load material collected in the pan increases the pan is lowered along the tracks. Movement of the pan to the elbows in the tracks, dictated by a predetermined load weight, causes pivoting of the pan to unload the material collected therein. The resilient support arrangement for the pan returns the pan to the initial position thereof after unloading. The attachment is mounted on the combine as a single detachable unit.



3,567,073
DISPENSING CONTAINER WITH RUPTURABLE SPOUT
Reginald Friedenthal, 3 Northgate, Ring Road, Crown Gardens, Johannesburg, South Africa
Filed June 16, 1969, Ser. No. 833,626
Claims priority, application South Africa, June 19, 1968, 68/3909
Int. Cl. B65d *5/60, 5/74*
U.S. Cl. 222—88 **16 Claims**

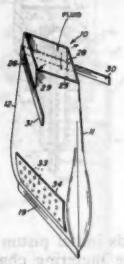


A container is disclosed of the type in which an outer casing of cardboard or the like encloses a plastics bag in which the contents of the container are inserted. The pointed end of a triangular ear formed in the bag when it is folded and sealed projects through an opening in a closure flap in the casing. The closure flap and ear are loosely sandwiched between two other closure flaps so that when the first-mentioned closure flap, which is attached to a breakaway piece from the sidewall of the casing, is removed from between the two other closure flaps, the ear is withdrawn with it. The opening has a cutting edge which ruptures the ear upon withdrawal.

3,567,074
PILLOW-TYPE PACKAGE THAT IS CONVERTIBLE TO A TETRAHEDRONAL PACKAGE FOR MIXING, STORING AND DISPENSING, WITH SPRAY-TYPE DISPENSING MEANS
Bernard Beau Brown, Westfield, N.J., assignor to CPC International Inc.
Filed Oct. 25, 1968, Ser. No. 770,529
Int. Cl. B65d *35/08*
U.S. Cl. 222—107 **6 Claims**

A dispensing package, that is particularly useful for agricultural chemicals such as, for example, liquid or pow-

dered pesticides, is initially constructed so as to retain a substantially flat and easily shippable, compact shape when a small quantity of a chemical or other substance is packed inside. The dispensing package is easily opened for adding water or other substances thereto, and is then readily resealed into a tetrahedronal shape, for use as a shaker and



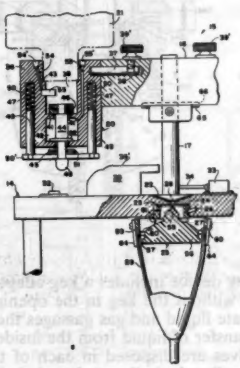
dispenser. A series of orifices is located in a panel of the package. These orifices are initially sealed by a removable strip of pressure-sensitive adhesive tape. The substance packed inside the package is easily dispensed therefrom by removing the tape from the orifices, then holding the package so that the substance can run out of the orifices.

3,567,075

DISPENSING APPARATUS FOR A PLURALITY OF LIQUIDS TO MAKE A RAINBOW COCKTAIL OR THE LIKE

Dino Neri, 34-44 82nd St., Jackson Heights, New York, N.Y.

Filed Aug. 28, 1969, Ser. No. 853,731
Int. Cl. B67d *5/56*
U.S. Cl. 222—129.4 **15 Claims**



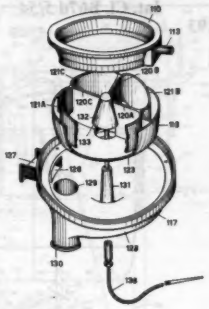
A motor-driven Geneva movement indexing device controls a horizontally positioned turret having a plurality of equiangularly spaced stations, at all except one of which is a releasably mounted structure serving as a cap for an inverted supply bottle, as well as a measuring means and a valve means. Each valve means, in turn, is operated by a cam fixed on the frame, to discharge into a funnel over a glass in whose mouth sits a flow spreader means directing the discharge along the inside surface of said glass. There is sufficient dwell at each stop of the turret to assure emptying of the measuring chamber. At normal rest condition of the apparatus, the blank station is over the glass. A push button switch is for starting a cycle of operation. Turret rotation automatically controls a switch to stop operation at the end of one revolution of the turret which is the duration of a cycle.

3,567,076

ROTARY DISTRIBUTOR ASSEMBLY FOR WASHING MACHINES

Lino Zanussi, Ronche di Fontanafredda, Italy, assignor to Industrie A. Zanussi S.p.A., Pordenone, Italy

Filed May 8, 1968, Ser. No. 727,645
Claims priority, application Italy, May 20, 1967, Dec. 12, 1967, Feb. 13, 1968, 16337/67;23787/67;12702/68
Int. Cl. B67d *5/60*
U.S. Cl. 222—144 **15 Claims**



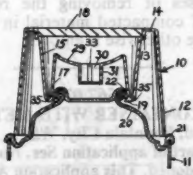
A rotary distributor for sequentially dispensing dosage units of detergents in a washing machine including a plurality of sectoral compartments adapted to hold each a different kind of detergent, with the distributor also serving as a water-flow intercepting means and means for imparting a predetermined direction to a water jet impinging into the distributor for sweeping away the detergent towards the washing tub of the machine. Means are also provided for transferring the drive, unidirectionally, from the shaft of the programming timer of the machine to the rotary distributor, along with means for discharging the water left in the individual compartments of the distributor on completion of a washing cycle.

3,567,077

DIRECTIONAL CLOSURE FOR A CONTAINER

Richard F. Hendrickson, Erie, and Roderick V. King, Girard, Pa., assignors to Sterling Seal Company, Erie, Pa.

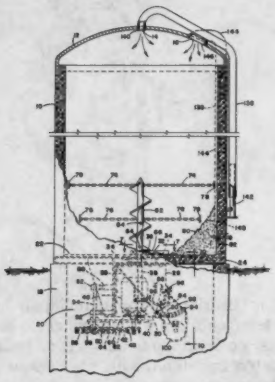
Continuation-in-part of application Ser. No. 704,885, Feb. 12, 1968. This application Nov. 12, 1968, Ser. No. 775,040
Int. Cl. B67b *5/00*
U.S. Cl. 222—153 **9 Claims**



A cap and an aerosol can. The can has a sidewall that terminates adjacent its upper edge in an upwardly facing groove. A can breast extends upwardly from the groove and terminates in a mounting cup having a downwardly facing shoulder. The cap has an outer wall, an inner wall and an intermediate wall, all concentric with each other. The intermediate wall and inner wall are fixed together but weakened so that they can be severed and separated to allow half of the cap to be removed from the can. The inner wall has a bead or rim around its inner periphery. The bead snaps under the mounting cup on the can and holds the inner wall fixed to the

mounting cup when the intermediate and outer walls are removed.

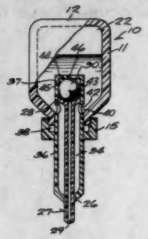
3,567,078
BOTTOM DISCHARGE MEANS FOR SILO
John H. Herr, Lebanon, and Aaron Z. Stauffer, Ephrata, Pa., assignors to Flying Dutchman Mfg. & Sales Co., Inc., Lebanon, Pa.
Continuation-in-part of application Ser. No. 634,534, Apr. 28, 1967, now Patent No. 3,424,350. This application Jan. 23, 1969, Ser. No. 793,489
Int. Cl. B67d *5/54*
U.S. Cl. 222—193 **22 Claims**



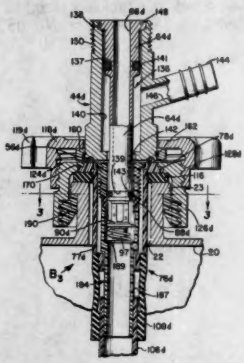
Bottom discharge means for silo having a cylindrical shell provided with a top and bottom, the bottom having a discharge opening adjacent the center, an auger having a coarse pitch and flexible dislodging members which ultimately extend radially are connected to a shaft extending upward through the bottom of the silo shell, and a housing depending from said bottom and provided with a discharge guide sloping downwardly and outwardly to a discharge port having a closure provided with dislodging means when initially moved to open position, one embodiment of the invention having an auger-type removal means communicating with the discharge port and another embodiment having a blower connected by a chute to the discharge port and the closure member serving additionally as a means to regulate the amount of air delivered to the entrance of the fan. Loading and vent means extending to the top of the silo also are provided to prevent the necessity of climbing to the top of the silo at any time during unloading or loading thereof. Additionally, auxiliary unloading means are detachably connectable to the shaft and auger for purposes of removing the remaining, conical-shaped residue of compacted material in the bottom of the silo when the same otherwise is empty.

3,567,079
DISPENSER CONTAINER WITH METERING NECK
Cleone H. Weigand, Fountain City, Wis.
Continuation-in-part of application Ser. No. 588,160, Oct. 20, 1966, now abandoned. This application Aug. 8, 1968, Ser. No. 751,314
Int. Cl. B65d *37/00*
U.S. Cl. 222—213 **11 Claims**

A compressible or yieldable fluid container with an elongated neck in the form of a metering chamber receives a piston or ball which is urged through the metering chamber by compression of the container wall. The length of the metering chamber and thus the quantity of fluid to be discharged may be varied by axial adjustment of a tubular valve stem located within the metering chamber. The outer end of the hollow valve stem projects from the metering chamber and serves as the container outlet. The inner end of the valve stem has a valve seat to receive the free piston and limit travel of the piston. In one embodiment fluid flow through the metering chamber is controlled by minor and major pistons connected in tandem by a piston rod. In some embodiments a vacuum chamber at the inner end of the metering chamber retards initial piston movement and premature leakage until the metering chamber is filled with the measured charge and the charge is dispensed.



3,567,080
TAPPING DEVICE FOR BEER KEGS AND THE LIKE
Mack S. Johnston, Rolling Hills, Calif., assignor to Johnston Enterprises, Inc., East Kalispell, Mont.
Original application Oct. 18, 1966, Ser. No. 587,627, now Patent No. 3,422,448, dated Jan. 14, 1969. Divided and this application Jan. 13, 1969, Ser. No. 790,742
Int. Cl. B65d *83/00*
U.S. Cl. 222—400.7 **30 Claims**

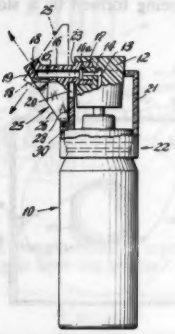


The tapping device includes a keg adapter releasably connected from without the keg in the opening of the keg and having separate liquid and gas passages therethrough for the respective transfer of liquid from the inside to the outside of the keg. Valves are disposed in each of the liquid and gas passages. A collar, including a threaded ring underlying the keg flange, overlies a flange on the keg adapter to clamp the latter in the keg opening. A dispensing coupler having a depending probe is releasably secured to the keg adapter with the probe opening the normally closed valve in the liquid passage when the coupler and keg adapter are assembled.

3,567,081
MULTIDIRECTIONAL AEROSOL DISPENSER
Philip Meshberg, Fairfield, Conn.
Filed Jan. 30, 1969, Ser. No. 795,251
Int. Cl. B65d
U.S. Cl. 222—402.17 **5 Claims**

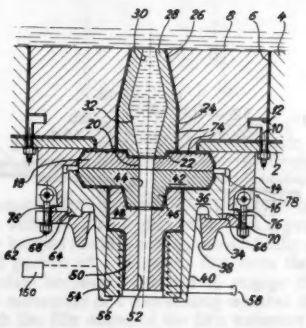
A simplified multidirectional aerosol dispenser for dispensing the aerosol in a plurality of directions from a container without turning the container from a substantially vertical position, said dispenser having a rotatable cylindrical dispensing tube having an angular end surface, said tube being provided with a dispensing passage opening in said an-

gular end surface, and a manipulating member secured to the dispensing tube for rotating said tube and having a surface extending in the direction of said passage to indicate the



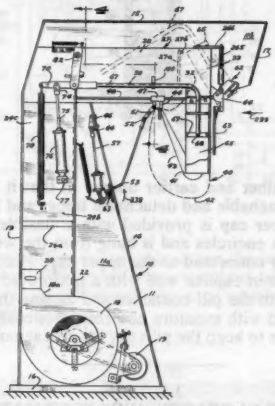
direction of the dispensing of the aerosol. Means can be provided for preventing inadvertent rotation of the dispensing tube or inadvertent actuation of the actuating button.

3,567,082
CASTING INSTALLATION
Bernhard Tinnes, Zollikon, Switzerland, assignor to Metacon AG, Zollikon, Switzerland
Filed Feb. 20, 1968, Ser. No. 706,976
Claims priority, application Switzerland, Feb. 24, 1967, 2739/67
Int. Cl. B22d *37/00*
U.S. Cl. 222—561 **9 Claims**



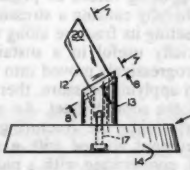
A casting installation comprising a container for a molten metal and provided with control slide means disposed at the region of the bottom opening of the container. The control slide means incorporate a housing and a cover member, with a slide member movably mounted between such housing and cover member. Further, a slide plate is provided for said slide member, said slide plate having a throughflow opening. Means are provided for guiding said slide member in a substantially linear path, such linear guiding means being guide groove means or guide ledge means provided on the cover member. Positioning element means provided at the cover member and the housing engage one another, in order to maintain the path of sliding movement for the slide member which is determined by said linear guiding means in a plane containing the axis of material throughflow.

3,567,083
PANTS TOPPER APPARATUS
Calvin E. Piilola, Minneapolis, Minn., assignor to The Unipress Company, Incorporated, Minneapolis, Minn.
Filed Oct. 9, 1969, Ser. No. 865,111
Int. Cl. D06c *15/00, 5/00*
U.S. Cl. 223—73 **14 Claims**



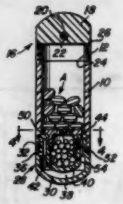
Pants topper apparatus having a buck assembly including an inflatable bag, a fly clamp assembly, a pair of pleat pressing assemblies, a fan and heater assembly and control mechanism for controlling the operations of the fly clamp assembly, the expansion of the waist of the pants, the pleat pressing assemblies and the application of steam and air to the pants. Each pleat pressing assembly includes a pleater plate control arm that is moved by a piston cylinder combination, and through spring and bracket mechanism, first is swung downwardly in an arc and then moved rearwardly a short distance.

3,567,084
DISPLAY SUPPORT DEVICE
Frank P. DeWitt, Skaneateles, N.Y., assignor to Shoe Form Co., Inc., Auburn, N.Y.
Filed Feb. 27, 1969, Ser. No. 802,997
Int. Cl. A47f *5/00, 7/00*
U.S. Cl. 223—120 **1 Claim**



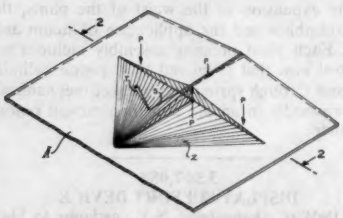
A support for a form in the shape of a human body portion for displaying a garment has a clamp for embracing a portion of the form to hold it erect. The clamp has a downwardly projecting dovetail flange. A pedestal, secured to a flat base, has a complementary dovetail groove in its upper surface which is slanted at a large angle to the horizontal. The flange and groove are each similarly tapered from a wide upper end to a narrower lower end so that the clamp and pedestal can be locked together by sliding the flange into the groove.

3,567,085
NECK-SUPPORTED PILL CONTAINER
James G. Flores, 717 National Ave., Sheboygan, Wis.
Filed Dec. 2, 1968, Ser. No. 780,468
Int. Cl. A45f 3/00
U.S. Cl. 224—5 3 Claims



A pill container and carrier unique in that it embodies a vial having attachable and detachable upper and lower screw caps. The upper cap is provided with a flexible suspension element which encircles and is hung from the wearer's neck and is slidingly connected to the upper cap. The lower screw cap has a built-in cuplike well with a perforated cover communicating with the pill container and closing the well. This well is charged with moisture absorbing desiccative granules which function to keep the pills dry for efficacious use.

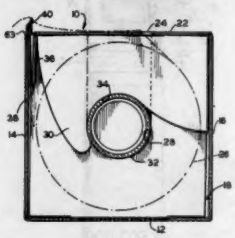
3,567,086
METHOD OF FRACTURING SHEET MATERIAL
John D. Wark, Freeport, and Henry A. Holzwarth, Bayside, N.Y., assignors to Monsanto Company, St. Louis, Mo.
Filed Nov. 29, 1968, Ser. No. 780,076
Int. Cl. B26f 3/00
U.S. Cl. 225—2 5 Claims



A process for fracturing sheet material, particularly sheets of polymer material that include as an ingredient reinforcing filler material, such as particles of siliceous compounds which are useful in resisting abrasion; this process includes scribing the sheet along the line of desired fracture, and subjecting the sheet to opposing forces of pressure, especially along the score line, thereby causing a stressing of the sheet in this vicinity and effecting its fracture along said score line. This process is especially useful in a sustained operation wherein the sheet is progressively moved into the instrumentalities for scribing and applying pressure, thereby effecting a continuing fracture of the scored sheet. An embodiment of the apparatus for performing the fracturing operation includes a scribing instrument aligned with a sheet elevating device, such as a skid, cooperating with a pair of offset rollers laterally of the skid for creating the opposing forces necessary for effecting stressing of the sheet and its fracture along the score line.

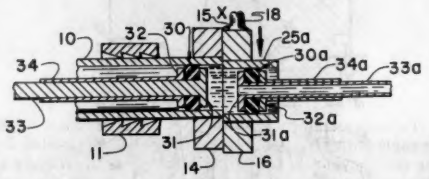
3,567,087
PLASTIC CUTTER BLADE FOR WRAPPING FILM CUTTER BOX
Richard F. Schramm, St. Louis, Mo., assignor to Speed Equipment Incorporated, St. Louis, Mo.
Filed Feb. 3, 1969, Ser. No. 796,079
Int. Cl. B26f 3/02
U.S. Cl. 225—43 7 Claims

A plastic cutter blade for a dispenser box for dispensing sheet materials from a roll of flexible film, aluminum foil, and the like. The box receives a roll of sheet material with the web extensible over the cutter blade. The cutter blade is specially formed of plastic and is supported upon a foldable front tab of the box top, which is hinged behind the front wall of the box with the cutter blade extending slightly above the box. The plastic cutter blade has specially formed shoulders, one shoulder being formed by a slot with a shoulder



between two legs, said shoulder resting upon the tab extension of the box top in squared relation for a firm adhesion and support thereto, while a second shoulder defined by a squared edge of one of the legs rests upon the top edge of the front of the box in bearing relation to relieve strain upon the tab extension member of the box top supporting the cutter blade. The blade is formed of serrated teeth and is adapted to be simply molded or cast.

3,567,088
APPARATUS FOR SHEARING RIGID WALL TUBES
George L. Andersen, Franklin County, Ohio, assignor to Colorado Manufacturing Corporation, Colorado Springs, Colo.
Filed June 24, 1969, Ser. No. 835,934
Int. Cl. B23d 21/00
U.S. Cl. 225—103 1 Claim

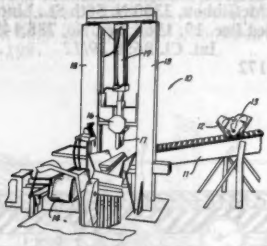


A method and apparatus for shearing or breaking a metal tube or the like by confining and supporting the tube on both its inner and outer surfaces and on either side of a given shear plane, and then applying a shear force to the supported tube sufficient to break it transversely along the shear plane.

3,567,089
ENGINE BLOCK BREAKING APPARATUS
George R. Klempner, and Sam Rosenberg, Louisville, Ky., assignors to Foundry Suppliers, Inc., Louisville, Ky.
Filed Sept. 12, 1968, Ser. No. 759,454
Int. Cl. B26f 3/00
U.S. Cl. 225—104 1 Claim

Disclosed is an apparatus in which a movable breaking or splitting tool moves between adjustably spaced supports on which may be positioned a junked engine block which is to be "cleaned," that is, in which the steel, aluminum and cast

iron components of the engine are to be separated. The movement of the splitting blade through the engine block



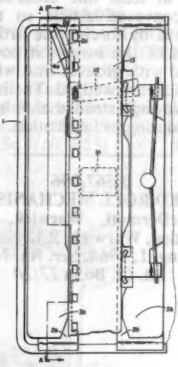
breaks the block longitudinally, separating the pistons, crankshaft and oil pan from the engine.

3,567,090

CINEMATOGRAPHIC APPARATUS

Hermann Claar, Stuttgart-Hedelfingen, Germany, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 1, 1969, Ser. No. 811,751
Claims priority, application Germany, Oct. 10, 1968, 1,802,215
Int. Cl. B65h *25/00*
U.S. Cl. 226—11 10 Claims



A cinematographic apparatus having a film transport claw engageable with film ahead of the film gage is provided with a drag claw beyond the film gate to automatically remove the trailing end portion of a projected film from the film gate. The drag claw becomes operative to engage the film, in response to movement of a film-sensing member disposed for contact with the film ahead of the film transport claw, only when film projection has been completed.

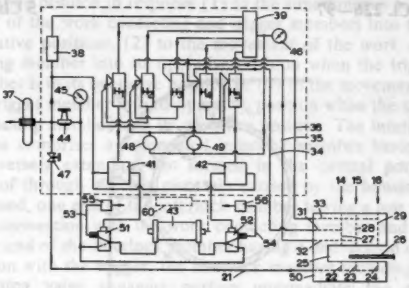
3,567,091

ARRANGEMENTS FOR CONTROLLING THE LATERAL POSITION OF A WEB OF MATERIAL

Duncan J. Woolard, Sevenoaks, Kent, England, assignor to Mount Hope Machinery Company, Taunton, Mass.

Filed Dec. 30, 1968, Ser. No. 787,898
Claims priority, application Great Britain, Aug. 6, 1968, 37,491/68
Int. Cl. B65h *25/08*
U.S. Cl. 226—18 14 Claims

An apparatus for controlling the lateral position of a web of material, having a sensing head with three pneumatically operated sensing elements each of which senses the presence or absence of the web in the head. First and second sensing elements are nominally disposed with one longitudinal edge of the web therebetween and the third sensing element is disposed inwardly of the element nominally sensing the presence of the web so as to do likewise. Signals from the first and second elements are fed to a control means which



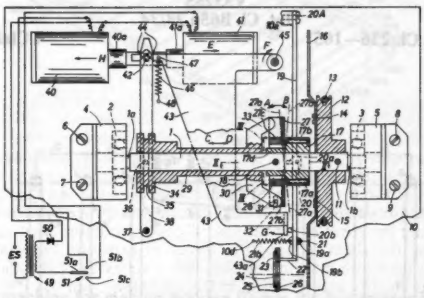
activates an adjusting device to maintain the web in a desired lateral position while signal from the third sensing element indicating absence of the web is used to inhibit the operation of the adjusting device.

3,567,092

CINEMATOGRAPHIC APPARATUS

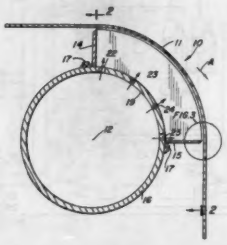
Hans Heinin, Munich; Erich Filsinger, Unterhaching; Wolfgang Geisslinger, and Heldemar Radl, Munich, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed June 5, 1969, Ser. No. 830,593
Claims priority, application Germany, June 7, 1968, 1,772,602
Int. Cl. G03b *1/22*
U.S. Cl. 226—66 22 Claims



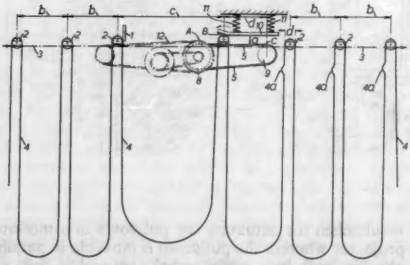
A mechanism for actuating the pulldown in a motion picture projector wherein the pulldown is movable in parallelism with the film path by a rotary radial cam and at right angles to the film path by a rotary axial cam tiltable about an axis which is normal to and intersects the common axis of the two cams to thereby effect stepwise forward or rearward transport of motion picture film. Such tilting is caused by axial movements of a sleeve which surrounds the common drive shaft of the cams and is coupled to the axial cam by a pin-and-slot connection. The sleeve is movable axially in opposite directions by a lever which is coupled to the cores of two electromagnets each of which is energizable independently of the other. A centering lever automatically returns the sleeve and the axial cam to a neutral position when the two electromagnets are deenergized whereby the axial cam is disengaged from the pulldown to permit rapid rewinding of film or prolonged projection of the image of a selected film frame.

3,567,093
FLUID CUSHION TURNING ROLL FOR MOVING WEB
Lloyd W. Johnson, Union Lake, Mich., assignor to Michigan Oven Company, Romulus, Mich.
Filed June 3, 1969, Ser. No. 829,851
Int. Cl. B65h 17/32
U.S. Cl. 226—97 5 Claims



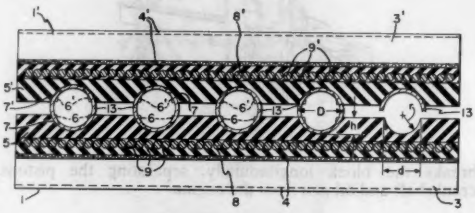
A fluid cushion turning roll for supporting a longitudinally moving web around an arcuate turn, comprising a pair of radial side plates at the opposite ends of the turn, an array of arcuate-edged baffle members extending between the side plates, and a base member closing off the bottoms of the baffle members to define a plurality of narrow arcuate pressure chambers across the inside of the turn. A constant-pressure fluid supply supplies air or other gas to all of the pressure chambers, through limiting orifices in the base member, affording a fluid cushion supporting the web out of engagement with the solid elements of the turning roll.

3,567,094
APPARATUS FOR PARTIALLY ELIMINATING MARKS IN FESTOONED SHEET MATERIALS
Tomas Murath, Krahenwinkel, Hannover, Germany, assignor to Vereinigte Schmirgel - und Maschinenfabriken A. G., Hannover-Hainholz, Germany
Filed Jan. 18, 1968, Ser. No. 698,770
Claims priority, application Germany, Mar. 15, 1967, V33255
Int. Cl. B65h 23/34
U.S. Cl. 226—105 4 Claims



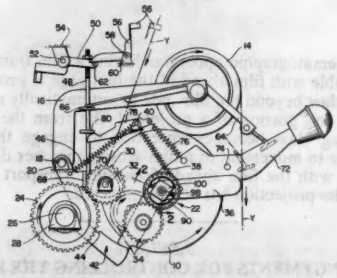
A device for eliminating marks in materials which are made in continuous lengths, such as paper which, during their manufacturing processes are suspended in loops from carriers travelling on a conveyor. The device includes a transporting mechanism comprising friction faced endless transporter belts operable independently of the conveyor which is arranged to temporarily lift the carriers from the conveyor into contact with a pressure-applying plate member positioned to exert pressure on the carriers. This pressure causes the carriers to rotate the material relative thereto so that folds or creases are prevented.

3,567,095
BELT STRUCTURE
Joseph C. Geist, 6401 Cleveland Ave., Lincoln, Nebr.; William S. Korff, 9215 Valley Stream Road, Clarence, N.Y., and John F. McGibbon, 3300 N. 56th St., Lincoln, Nebr.
Filed Dec. 19, 1968, Ser. No. 785,149
Int. Cl. B65h 29/12
U.S. Cl. 226—172 10 Claims



A flexible endless belt for use as at least one of the belts in a belt drive assembly of the type in which two belts cooperate to drive and convey elongated articles in the direction of travel of the belts by engaging opposite sides of the article. The belt includes a drive cover, a tension section, and an article-engaging cover of compressible material which includes one or more grooves therein of various cross-sectional configurations which extend longitudinally of the belt. The grooves have at least one cross-sectional dimension smaller than the conveyed article so that the article is wedged in the groove by forcing the article therein. In the most common form of the invention both belts of the assembly are provided with grooves into which opposite sides of the conveyed article are wedged. The invention is particularly useful for conveying extruded aluminum tubing without slippage or damage during its fabrication.

3,567,096
FEED ROLL MECHANISM
Richard Brian McDermott, Warwick, R.I., assignor to Leesona Corporation, Warwick, R.I.
Filed Aug. 1, 1968, Ser. No. 749,502
Int. Cl. B65h 17/20
U.S. Cl. 226—188 3 Claims



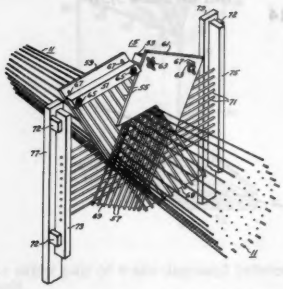
A positive drive strand-handling mechanism for advancing one or more strands of yarn about a feed roll. The mechanism has provision for stopping the feed roll by disengaging a train of gears in the event of strand breakage, and for absorbing shock when the gears are engaged to again advance the strand. The shock-absorbing means is a gear on a common shaft with the feed roll, the gear having slots substantially encircling the shaft with means including resilient elements in the slots for absorbing shock and drivingly connecting the gear and the shaft.

3,567,097

STRAND GUIDING MEANS

Stephen R. Baker, Oley, and Michael F. Harter, Bethlehem, Pa., assignors to Bethlehem Steel Corporation

Filed June 19, 1968, Ser. No. 738,313
Int. Cl. B65h 23/32; B21d 43/16; B54h 27/00
U.S. Cl. 226—199 10 Claims



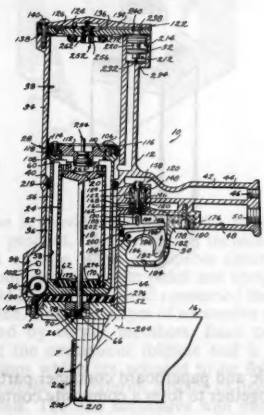
Two series of parallel rods are arranged adjacent each other in a crossed pattern to define guide openings through which wires may pass to a closing die. The rods may be rotatably journaled to reduce wear and may also be mounted in a floating frame to provide transverse movement.

3,567,098

FASTENER DRIVING APPARATUS OPERABLE UNDER PRESSURE CONDITIONS GREATER THAN LINE PRESSURE

George A. Maynard, East Greenwich, R.I., assignor to Bostitch Division of Textron, Inc., East Greenwich, R.I.

Filed Dec. 23, 1966, Ser. No. 604,435
Int. Cl. B25c 5/10; B25j 13/02; B25i 5/06
U.S. Cl. 227—5 21 Claims



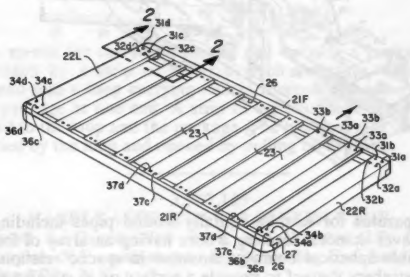
A fastener driving apparatus in which the fastener driving means in the form of a piston and piston rod construction is mounted within a cylinder which is movable from a first position into a second position by fluid pressure in the reservoir of the apparatus, while the fastener driving means is maintained in a fastener receiving position. Movement of the cylinder from the first position to the second position establishes a negative pressure beneath the driving piston and/or a pressure equal to reservoir pressure or greater than reservoir pressure above the driving piston so that when the fastener driving means is released it will move from the fastener receiving position into a fastener driven position under differential pressure conditions which are greater than reservoir pressure above the piston and atmospheric pressure below the piston. The apparatus is actuated by a work contacting member and a trigger member through an interlock means which effects movement of an actuating valve into an actuating position in response (1) to the simultaneous movement of the work contacting and trigger members into their operative positions, (2) to the movement of the work contacting member into its operative position when the trigger member is in its operative position or (3) to the movement of the trigger member into its operative position when the work contacting member is in its operative position. The interlock means comprises an elongated interlock member having a transversely extending slot formed in the central portion thereof through which a pivot pin carried by the housing is disposed, one end of the interlock member having a lost motion connection with the work contacting member and the other end of the interlock member having a lost motion connection with the trigger, the interlock member including an actuating valve engaging portion intermediate the ends thereof.

3,567,099

BEDSPRING FRAME MACHINE

Thomas F. Winters, Clear Lake Highlands, Calif., assignor to Powers Wire Products Co., Inc., El Monte, Calif.

Filed Nov. 1, 1968, Ser. No. 772,491
Int. Cl. B27f 7/02
U.S. Cl. 227—100 6 Claims



A machine for making wooden frames for box springs has a support to hold the wood pieces in proper position and to advance the pieces in stages through the machine. As the joints between a transverse piece and a plurality of longitudinal pieces pass over an anvil, a head carrying a corresponding plurality of pneumatic nailing machines is depressed to bring the nailing machines into contact with the work and to trigger the same. Means is also provided to oscillate some of the nailing machines to set more than one nail at each joint.

3,567,100

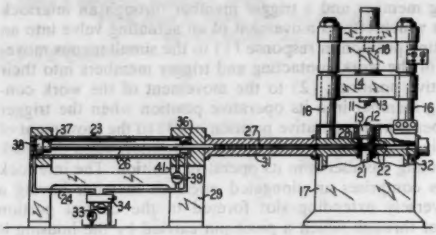
FRICTION-WELDING APPARATUS AND METHOD

Charles G. Farmer, Edelstein, and Calvin D. Loyd, Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed May 13, 1968, Ser. No. 728,646
Int. Cl. B23k 27/00
U.S. Cl. 228—2 11 Claims

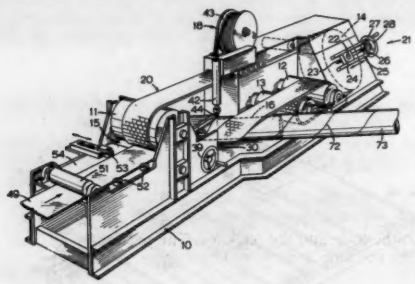
Friction-welding apparatus comprising a rack and pinion for translating force from a unidirectionally, linearly acting hydraulic motor into rotational force and applying the

resultant rotational force to one of a pair of relatively rotatable weld pieces. Programming means regulate operation of



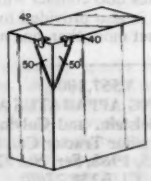
the hydraulic motor to precisely determine energy input to a weld interface between the weld pieces.

3,567,101
PRODUCTION OF SPIRALLY WOUND PIPE
Uno A. Ranne, Laval Des Rapides, Quebec, Canada, assignor to The Robert Mitchell Co., Limited, Montreal, Quebec, Canada
Filed Feb. 23, 1968, Ser. No. 713,560
Claims priority, application Canada, Jan. 2, 1968, 9,003
Int. Cl. B23k *1/20*
U.S. Cl. 228—15 **8 Claims**



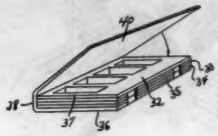
Apparatus for forming spirally wound pipes including a cantilever mandrel forming a core having an array of freely rotatable spherical bearings mounted in spaced relation on the periphery thereof to provide a surface on to which a strip of metal is helically fed, and a continuously moving belt forming the strip of metal on the bearings of the mandrel and feeding the formed pipe axially off the mandrel.

3,567,102
DISPENSING CARTON
Ruth S. Miller, Hyattsville, Md. (2715 Cortland Place NW. 22, Washington, D.C. 20008)
Filed June 6, 1969, Ser. No. 830,998
Int. Cl. B65d *5/72, 83/00*
U.S. Cl. 229—7 **5 Claims**



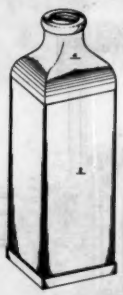
A dispensing carton in which a reclosable pouring opening located at one top corner is held closed by bendable fasteners which also aid in opening the corner for pouring the contents from the carton.

3,567,103
COMPOSITE SPACER AND LINER MEMBER FOR SHIPPING CONTAINERS
Robert F. Seifert, 2961 Exon Drive, Cincinnati, Ohio
Filed Apr. 23, 1969, Ser. No. 818,493
Int. Cl. B65d *5/56*
U.S. Cl. 229—14 **4 Claims**



A foldable, multiply article spacer, and liner member produced from a cut-and-scored blank and comprising a series of apertured article spacer panels foldable into a stack with the apertures in registry, a liner panel connected to and foldable upon an end spacer panel in the stack and mechanical fastener means securing together a common side of the panels in the stack.

3,567,104
COMPOSITE CONTAINERS
Vincent Arslanian, and Stafford D. Collie, Kansas City, Mo., assignors to Phillips Petroleum Company
Filed July 1, 1969, Ser. No. 838,267
Int. Cl. B65d *5/58*
U.S. Cl. 229—14 **5 Claims**

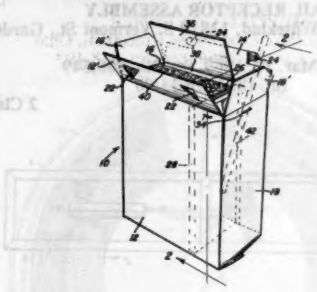


Molded plastic and paperboard container parts rigidly, fixedly attached together to form a composite container.

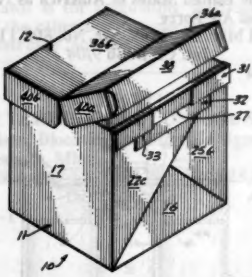
3,567,105
COMBINED FOOD AND DRINK CONTAINER
Bill E. Mc Farlin, R.R. Northeast Williston, Williston, N. Dak.
Filed June 26, 1969, Ser. No. 836,845
Int. Cl. B65d *5/48, 5/58*
U.S. Cl. 229—15 **8 Claims**

A container including parallel opposite sidewalls and parallel opposite end walls disposed at generally right angles relative to the sidewalls. The container includes a partition spaced between and generally paralleling a first pair of the walls and extending between and connected to the other pair of walls for folding with the first pair of walls toward collapsed positions paralleling the latter. Further, an open ended

flexible wall container is disposed and supported between the partition and a first wall of the first pair of walls and the portions of the other pair of walls disposed between the partition and first wall.



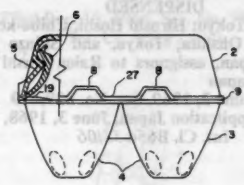
3,567,106
CONTAINER CONSTRUCTION
Wilbur G. Anderson, Grand Rapids, Mich., assignor to Packaging Corporation of America, Evanston, Ill.
Filed May 31, 1968, Ser. No. 733,389
Int. Cl. B65d *5/24*
U.S. Cl. 229—31 **8 Claims**



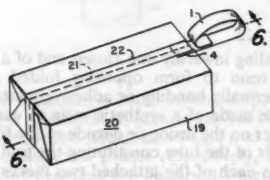
A container is provided for use in the bulk handling of a comminuted product. The container includes a receptacle formed from a single blank of foldable sheet material. The receptacle comprises a bottom panel and upright wall panels delimiting said bottom panel and connected thereto by a continuous foldline. Adjacent edges of successive wall panels are interconnected by corner members. Each corner member terminates at the continuous foldline and is provided with foldable sections which are adapted to be folded upon one another and overlie the exterior surface of one of the successive wall panels. The one successive wall panel is provided with a foldable extension which interlockingly engages the foldable corner member sections and retains same in overlying relation with respect to the wall panel exterior surface.

3,567,107
EGG CARTON
Kenneth W. Artz, Mohnton, Pa., assignor to W.R. Grace & Co., Duncan, S.C.
Filed Apr. 24, 1969, Ser. No. 819,004
Int. Cl. B65d
U.S. Cl. 229—44 **6 Claims**

A molded, one-piece egg carton having an egg-receiving tray, a lid hingedly attached to one side of the tray, a locking tab hingedly attached to the other side of the tray, and a locking bar on the interior surface of the front panel of the lid whereby when the locking tab is rotated and held so that the lid will close over it, the tab and bar cooperate to lock the lid to the tray.

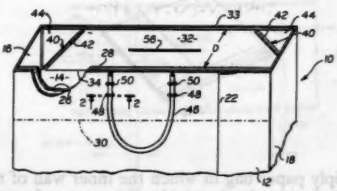


3,567,108
PULL TAB, LABEL AND HANDLE
Juliana M. Corridon, 7805 Takoma Ave., Takoma Park, Md.
Filed Feb. 3, 1969, Ser. No. 795,852
Int. Cl. B65d *5/46, 25/22, 75/56, 83/06*
U.S. Cl. 229—52 **5 Claims**



A means for carrying, labeling and opening a package is provided by a strip of material, such as paper, which is formed into a loop carrying indicia thereon and adhered to the package at one end. A strip of adhesive tape is also adhered to the loop and the package. The package may then be carried by the loop and opened by pulling on the loop.

3,567,109
HANDLE ASSEMBLY FOR FLEXIBLE BOX
Leonard E. Canno, New York, and William H.F. Grob, Babylon, N.Y., assignors to Equitable Bag Co., Inc., Long Island City, N.Y.
Filed June 30, 1969, Ser. No. 837,490
Int. Cl. B65d *33/12*
U.S. Cl. 229—54 **5 Claims**



For "flexible boxes" that have lower ends similar to bags and upper ends that are made like folding boxes, this invention provides a construction having a handle which is permanently connected to one of the panels at the top of the flexible box and that is "upside-down" as compared to handles of shopping bags. Because of this upside-down orientation, the handle can be attached to the box panel by a machine, and the handle is in a position in which it is out of the way when the flexible boxes are flat and stacked.

3,567,110
SEALED BAG HAVING A PAIR OF HANDLES ATTACHED TO TWO FOLDED END PORTIONS AND RETAINED THEREAFTER THE CONTENTS ARE DISPENSED

Rinnosuke Susuki, Tokyo; Hiroshi Hoshi, Chiba-ken; Shinichi Araki; Takashi Ohshita, Tokyo, and Shinzo Miyamoto, Saitama-ken, Japan, assignors to Raion Yushi Kabushiki Kaisha, Tokyo, Japan

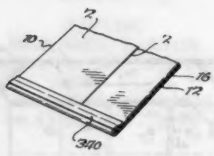
Filed June 2, 1969, Ser. No. 829,419
Claims priority, application Japan, June 3, 1968, 43/46316
Int. Cl. B65d *33/06*
U.S. Cl. 229—54 4 Claims

By first folding inwardly one closed end of a tube made of a synthetic resin to form opposing folded end portions, thereafter thermally bonding or adhesively attaching a thick piece of plate made of a synthetic resin to each of said end portions either on the inside or outside of the fold or between the two sheets of the tube constituting the fold, then forming a grip hole in each of the attached two pieces of plate (said grip hole may be formed in advance), thereafter packing desired contents in said tube from the open end on the other side of the tube, and then sealing this open end, there is provided a bag having a pair of grip handles which are retained on the bag after the portion of the tube material located between the folded two end portions is cut apart to dispense the contents.

3,567,111
MULTIPLY PAPER BAG

Robert O. Baxter; Clint R. Hollis, and Carlton F. Evans, Camden, Ark., assignors to International Paper Company, New York, N.Y.

Filed Apr. 24, 1969, Ser. No. 818,909
Int. Cl. B65d *33/02*
U.S. Cl. 229—57 10 Claims

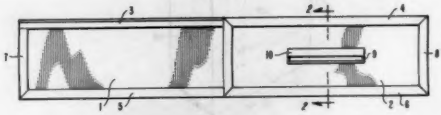


A multiply paper bag in which the inner wall of the inner ply is coated with a heat sealable moistureproof material and the end of the bag is folded, sealed and taped to form a leakproof closure. Apparatus for the manufacture of such bags having means for advancing bag blanks one after the other along a path, means along the path for heating the bottom end of the blank to soften the thermoplastic coating, means for applying a sealing force to the softened thermoplastic coating, means for holding the seal while the thermoplastic coating cools and hardens, means for embossing the bag blank along a fold line for folding the bag blank end along the fold line and for folding the folded portion into the sidewall of the blank and means for applying, coating and adhesively securing a tape to the folded portion and the sidewall of the blank.

3,567,112
MAIL RECEPTOR ASSEMBLY

Josephine Helen Wittekind, 13810 S. Vermont St., Gardena, Calif.

Filed Mar. 12, 1969, Ser. No. 806,549
Int. Cl. A47h *33/00*
U.S. Cl. 232—1 2 Claims



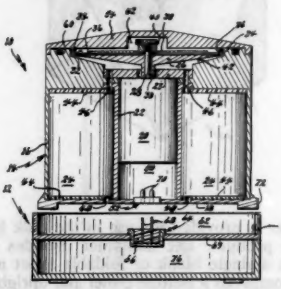
The instant invention involves an adjustable mail receptor assembly essentially comprising two slidably connected sections wherein one section includes an opening adapted to receive mail. The sections are connected by channel means integral therewith whereby the width of the entire assembly can be varied.

The receptor is put in place by raising the lower window, placing the receptor in place on the lower window frame and dropping the lower window until it rests on the receptor.

3,567,113
MINIATURE, PORTABLE, SELF-POWERED, HIGH SPEED, CLINICAL CENTRIFUGE

Marion J. Stansell, and Oskar G. Langner, San Antonio, Tex., assignors to the United States of America as represented by the Secretary of Air Force

Filed Mar. 18, 1969, Ser. No. 808,118
Int. Cl. B04b *9/04*
U.S. Cl. 233—24 5 Claims



A portable, miniature, self-powered, high-speed, clinical centrifuge having a housing, a motor, an energizing means, a rotor head and a rotor head cover. The energizing means for the motor is capable of being charged by a removable charger. Operation of the centrifuge rotates the rotor head at a high speed thereby separating blood cells from blood plasma within a capillary tube located within said rotor head. A timer regulates the length of time the centrifuge is in operation.

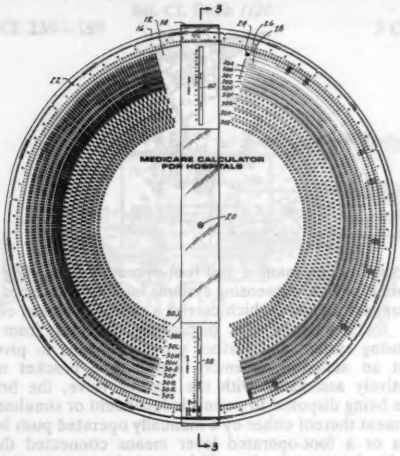
3,567,114
MEDICARE CALCULATOR

Burke Frees, 2323 Anna Ave., Clearwater, Fla.

Filed Dec. 26, 1968, Ser. No. 787,022
Int. Cl. G06c *3/00*
U.S. Cl. 235—88 5 Claims

A medicare calculator comprising three stacked discs—a middle disc and two smaller outer discs—and a U-shaped in-

dicator, all of which are concentrically rotatably mounted on a rivet at their centers. Numerical information is printed on the disc such that when an outer disc is suitably aligned with the middle disc, proper placement of the indicator reveals the number of days a patient was under medical care, the patient's cost for the care, the total Medicare cost, and the days on which a patient is to be reviewed and examined. One side of the calculator is for calculating Medicare expenses for hospitals and the other side for calculating Medicare expenses for extended care facilities.

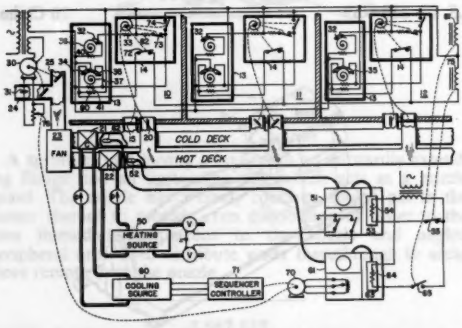


3,567,115

ZONE TEMPERATURE CONTROL SYSTEM

Lorne W. Nelson, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 19, 1969, Ser. No. 825,899
Int. Cl. F24f *3/08*
U.S. Cl. 236—1 **9 Claims**



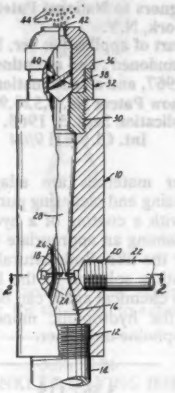
A zone temperature control system having a thermostat in each zone for controlling a supply of temperature changing medium to that zone. The thermostat having a first electrical output for modulatingly controlling the flow of medium to its zone and a second electrical output which can be selected when that zone has the greatest conditioning load to modulatingly control the temperature of the medium delivered to the plurality of zones from a central source.

3,567,116

ATOMIZING METHOD AND APPARATUS

James A. Lindlof, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 18, 1968, Ser. No. 784,697
Int. Cl. A01g *15/00*
U.S. Cl. 239—2 **6 Claims**



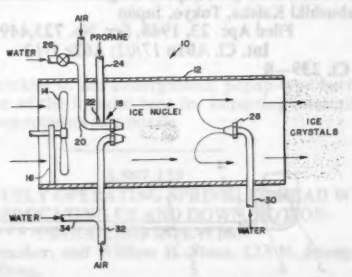
A method for atomizing a liquid which comprises the steps of (1) forming a dispersion of minute gas bubbles in a flowing enclosed pressurized liquid, said liquid and gas being the continuous and dispersed phases respectively, and (2) subsequently forcibly expelling the dispersed system through an hydraulic atomizing nozzle into an ambient atmosphere to provide an expanding stream of minute droplets. The preferred apparatus for carrying out the method of the invention is a venturi tube fitted at one end with an hydraulic atomizing nozzle, the compressed gas being introduced into the liquid at the throat of the venturi.

3,567,117

ICE NUCLEI FORMATION

William E. C. Eustis, Cambridge, Mass., assignor to Hedco, Inc., Bedford, Mass.

Filed Aug. 29, 1969, Ser. No. 854,102
Int. Cl. A01g *15/00*
U.S. Cl. 239—2 **9 Claims**



A method of making snow by controlling the size and life of ice nuclei generated in a snow-making machine. Ice nuclei are generated by homogeneous nucleation in a tunnellike housing through injection of propane or other refrigerant into a stream of moist air. The relative humidity about the ice nuclei stream is controlled relative to the temperature and humidity of the atmosphere to prevent or inhibit evaporation of the ice nuclei for such time as to ensure statistically effective mixing with adjacent liquid phase water droplets which

are supercooled by the air mass. The ice nuclei formed infect the water droplets and they release their latent heat to the air to form snowlike particles.

3,567,118

ENTRAPPED ESSENCES IN DRY COMPOSITE FIBER BASE PRODUCTS GIVING A STRONG FRAGRANCE WHEN WET IN WATER

Thomas H. Shepherd, Hopewell, and Francis E. Gould, Princeton, N.J., assignors to National Patent Development Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 727,047, May 6, 1968, now abandoned, and a continuation-in-part of 654,044, July 5, 1967, and a continuation-in-part of 567,856, July 26, 1966, now Patent No. 3,520,949, dated July 21, 1970. This application Sept. 5, 1968, Ser. No. 757,636

Int. Cl. A61l *9/04*

U.S. Cl. 239—6 15 Claims

Composite fiber materials are adapted for odorizing, deodorizing, sanitizing and cleansing purposes by treating the fibrous material with a coating of a hydrophilic acrylate or methacrylate containing an appropriate essence, bactericide, cleansing agent or the like. Both natural and synthetic fibers can be treated with a solution of the hydrophilic polymer. Entrapment of the chemical agent can be prolonged by using a copolymer of the hydrophilic monomer with a minor amount of a hydrophobic monomer.

3,567,119

ENHANCED DIFFUSION OF ODOR VAPOR FROM POLYMERS

Godfrey Wilbert, Seminary Hill Road, Carmel, N.Y., and Thomas Brown, 3767 S. Park Ave., Blaspell, N.Y.

Filed Oct. 6, 1969, Ser. No. 864,184

Int. Cl. A61k *21/12*; A61l *9/04*; C11b *9/00*

U.S. Cl. 239—6 10 Claims

This invention describes improved methods for the incorporating of fragrance compounds or oil bouquets and/or topical antifungal or antibacterial agents, insect repellent compounds and certain odoriferous medicaments into polymeric or natural materials so that the fabricated product possesses the properties imparted by the additive or additives for a long period of time. The efficiency of incorporating these additives in the materials mentioned above is improved by the use of surfactants and the effectiveness and duration of the additive or additives in the fabricated product is enhanced by employing antioxidants and/or ultraviolet radiation absorbers.

3,567,120

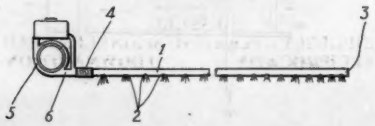
METHOD FOR SPREADING POWDER AND DEVICE THEREFOR

Nakao Suda, Sado-gun, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 23, 1968, Ser. No. 723,449

Int. Cl. A01n *17/02*; A62c *1/12*

U.S. Cl. 239—8 6 Claims



A method for spreading powder in which air under pressure carrying a pulverulent treating agent in the form of powder and/or granular material is forced into a soft and light tubular pipe from one end or both ends thereof and discharged or spread downwardly through a plurality of nozzles disposed spaced apart from each other longitudinally of the tubular pipe.

3,567,121

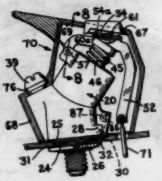
MANUAL AND FOOT-OPERATED DISPENSING HEAD ASSEMBLY FOR FLUID-DISPENSING SYSTEMS

Richard C. Dreibelbis, Fair Lawn, N.J., assignor to H & H Thermostats, Inc., Cedar Grove, N.J.

Filed Feb. 28, 1969, Ser. No. 803,304

Int. Cl. E03b *9/20*; B67d *5/54*

U.S. Cl. 239—29.5 13 Claims



A combination manual and foot-operated dispensing head assembly for fluid-dispensing systems including an inner body and support member which carries a normally closed control valve for regulating the dispensing of fluid from said dispensing system and further provides means to pivotally mount an actuating assembly including a bracket means operatively associated with the control valve, the bracket means being disposed to permit independent or simultaneous movement thereof either by a manually operated push button means or a foot-operated lever means connected thereto whereby the control valve will be moved to open position so as to permit a regulated flow of fluid to be dispensed by said dispensing head assembly. The dispensing head assembly additionally having a split outer casing disposed about and coacting with the inner body and support member to customize the dispensing head assembly to prevent easy access to the inner body member and support member and its associated bracket means, yet allows access with suitable tools when repairs or replacement of parts in the dispensing head assembly are required.

3,567,122

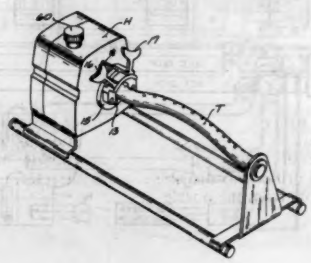
WATER SPRINKLER HAVING COUNTER MEANS FOR AN OSCILLATING DISTRIBUTING TUBE OF UNIFORM SPEED

George L. Congdon, Fort Atkinson, and Fred W. Kufrin, Janesville, Wis., assignors to Western Industries, Inc., Milwaukee, Wis.

Filed July 16, 1969, Ser. No. 842,123

Int. Cl. A01g *27/00*

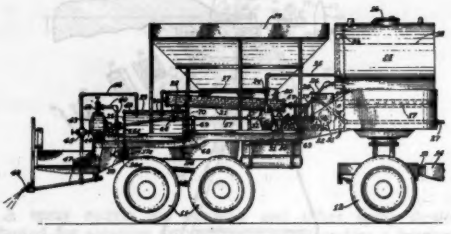
U.S. Cl. 239—69 10 Claims



A water sprinkler having an oscillating water tube that moves with a uniform velocity through an arc of adjustable length, including means for counting the number of oscillations of the distributing tube and depositing a predetermined amount of water per unit area of ground regardless of water pressure or the length of oscillatory swinging movement of the water tube. The means for oscillating the tube insures that it moves with uniform speed and insures that a known

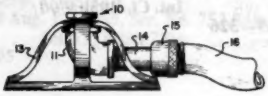
density of water deposit can be programmed regardless of the pressure of the water or area of ground to be covered.

3,567,123
PORTABLE ROAD SURFACING PLANT
Jack M. Mitchell, 642 N. 17th Ave., Phoenix, Ariz.
Filed July 9, 1969, Ser. No. 840,392
Int. Cl. B05b *1/20*
U.S. Cl. 239—159 **3 Claims**



A portable road-surfacing plant for storing, combining, mixing and applying at high temperatures predetermined proportions of asphalt and rubber.

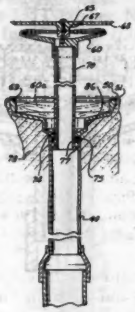
3,567,124
SPRINKLER UNIT
Adrian L. Jones, 2157 East 3380 South, Salt Lake City, Utah
Filed Dec. 23, 1968, Ser. No. 786,272
Int. Cl. B05b *15/02*
U.S. Cl. 239—118 **5 Claims**



A sprinkler unit having a body with an outwardly extending flange and an upstanding ring which acts as a nozzle guard. The nozzle has a freely rotating, angled pin in the center thereof to provide even distribution of water to the area immediately adjacent to the nozzle and angled peripheral orifices to distribute water therethrough to areas more remote from the nozzle.

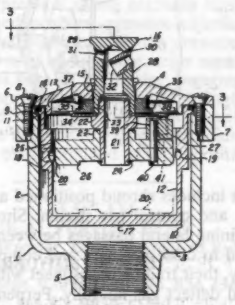
3,567,125
SPRAYING AND IRRIGATION EQUIPMENT
Henderson D. Houghton, 825 North Fifth West, Lehi, Utah
Filed June 28, 1968, Ser. No. 741,192
Int. Cl. B05b *15/10*
U.S. Cl. 239—204 **5 Claims**

The equipment comprises a novel spray head unit adapted to form a fog or fine misty spray at moderate liquid pressures by reason of high internal turbulence in the approach channel to the controlled gap where the liquid is broken up. Adaptations include below-ground head units which are self-elevating and normally elevated heads designed to form a frost-preventing mist above the tops of fruit trees and other



vegetation in freezing weather. The equipment is useful to form snow or ice, e.g. for ski areas, to extinguish fires, etc.

3,567,126
ROTARY SPRINKLER HAVING IMPULSE-TYPE TURBINE
Leo A. Martini, Garland, Tex., assignor to Telsco Industries, Garland, Tex.
Filed Feb. 18, 1969, Ser. No. 800,112
Int. Cl. B05b *3/02*
U.S. Cl. 239—206 **2 Claims**

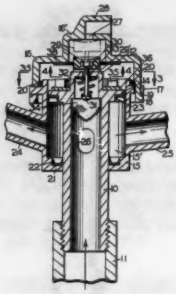


Rotary sprinkler of the underground, popup-type having a water turbine of the impulse type for imparting intermittent or step-by-step rotation to a nozzle.

3,567,127
CONTINUOUSLY OPERATING SPRINKLER HEAD WITH RECIPROCATING UP AND DOWN MOTION-PRODUCING ROTATION
Paul H. Raumaker, and William H. Stout, 233 N. Jessup St., Portland, Oreg.
Filed Apr. 18, 1969, Ser. No. 817,472
Int. Cl. B05b *3/04*
U.S. Cl. 239—237 **5 Claims**

A sprinkler head with nozzle arms is supported for rotation and restricted up and down movement. Pressure of water delivered tends to move the sprinkler head downwardly. An upper chamber in the sprinkler head has a top outlet port and a lower inlet port. Downward movement of the sprinkler head closes the top outlet port causing pressure to build up in the upper chamber which results in raising the sprinkler

head. This reopens the upper outlet port allowing the sprinkler head again to move downwardly and repeat the cycle.

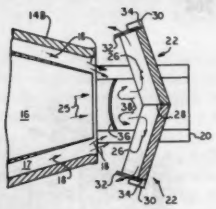


Each time the cycle is repeated the sprinkler head receives partial rotation through engagement with inclined elements.

3,567,128
THRUST REVERSING APPARATUS

George R. Urquhart; Dale W. R. Lawson, Bonita, and Jack H. Hilbig, Chula Vista, Calif., assignors to Rohr Corporation, Chula Vista, Calif.

Filed July 2, 1969, Ser. No. 838,541
Int. Cl. B64c *15/06*
U.S. Cl. 239—265.29 **20 Claims**



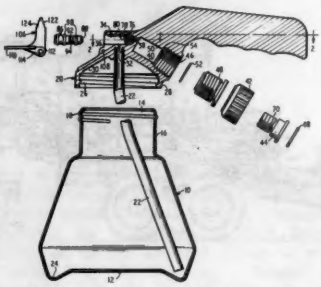
Apparatus includes shroud positioned at rear of jet nozzle to surround and control gas stream. Shroud includes fixed portions defining lateral passages between them and pivoted doors stowed to close passages and complete shroud. When doors deploy, their trailing edges meet within shroud contour to block and deflect gas laterally. Perpendicular retractable end plates at leading edges divert gas forwardly to create reverse thrust. Back pressure from reverser tends to cause back flow into ejector barrel surrounding nozzle in area upstream of fixed portions. Retractable fences are mounted on fixed portion inner faces to intercept and redirect back flow while allowing air flow through ejector barrel in region of fixed portions. Doors are controlled to any degree of deployment for fully modulated thrust control in flight, particularly useful for tactical military aircraft.

3,567,129
SPRAYING DEVICES

Wesley David Martin, New South Wales, Australia, assignor to G. G. Benjamin & Company Pty, Limited, New South Wales, Australia

Filed June 23, 1969, Ser. No. 835,409
Int. Cl. B05b *7/30*
U.S. Cl. 239—318 **10 Claims**

This invention relates to a combined jet nozzle and control valve assembly for particular use in devices using fluid pressure for aspirating a liquid or powder from a container and directing it from the jet nozzle. By combining the jet nozzle and control valve in the manner of the invention a mechanically simpler and more easily operable device than previously known ones is obtained. The device of the invention comprises a jet nozzle and control valve assembly including a housing adapted to be detachably secured to a container and having an aperture for communication with the interior of said container, a passage through said housing having said aperture communicating therewith and adapted to be connected at one end to a source of fluid pressure, a jet nozzle located in the other end of said passage and having a fluid passage therethrough in communication with said source of fluid pressure, and a further passage in communication

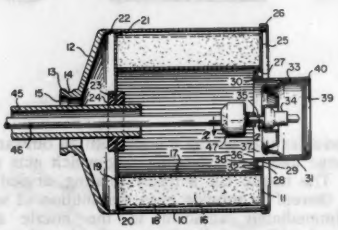


between said fluid passage and said aperture, a control valve located in a valve passage in said housing adjacent said one end of the first-named said passage, said control valve comprising a member slidable in said valve passage and having a hole formed therethrough for alternative movement into and out of coaxial register with and between said fluid passage and said source of fluid pressure and having a flat portion thereon engageable with a resilient sealing member on the adjacent end of said jet nozzle in all slidable positions of said control valve.

3,567,130
DIFFUSER

Earl T. Holt, Gastonia, N.C., assignor to Wix Corporation, Gastonia, N.C.

Filed Aug. 7, 1969, Ser. No. 848,265
Int. Cl. B05b *9/00*
U.S. Cl. 239—326 **10 Claims**



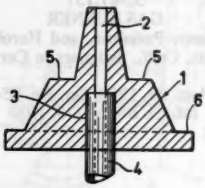
A diffuser having a pleated paper filter element within a closed body having only ingress and egress openings therein, an aerosol can containing a liquid under pressure, the liquid being a germicide, insecticide, deodorant, or the like and associated with the closed body. A nozzle associated with the aerosol can and operated by an operator is inserted into the closed body which is placed in position in an air circulating system whereby the contents of the aerosol can will be sprayed in the form of a fine mist or fog onto the filter element and where it will be diffused into the air circulating through the diffuser and carried into the system for distribution in a closed area.

3,567,131

NOZZLE FOR AEROSOL CONTAINERS AND OTHER SPRAY DEVICES

Ernst Claes Kare Loenegren, 2 Raustigen, Saltsjo-Duvnas, Sweden

Filed Sept. 19, 1967, Ser. No. 668,845
Claims priority, application Sweden, Sept. 23, 1966, 12831/66
Int. Cl. B05b 7/32
U.S. Cl. 239—337 3 Claims



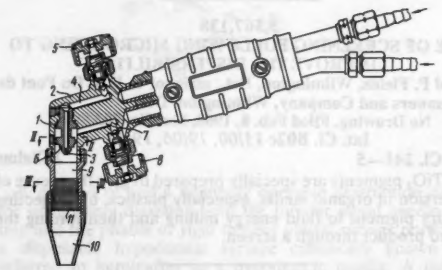
A spray nozzle for aerosols and other spray devices adapted for spraying an antifreeze agent and/or a lubricant into a lock, hinge, or the like. The nozzle comprises a generally conical member having an axially extending passageway for the discharge of material, and the nozzle toward its discharge end has diametrically opposed wedge-shaped portions removed therefrom so as to provide a cross-sectional width in one direction which is significantly less than that in a cross-sectional plane at right angles to the first, thereby providing a discharge end which may be readily inserted into a lock or the like but which nevertheless has sufficient strength to resist deformation.

3,567,132

GAS TORCH FOR WELDING PREFERABLY FUSIBLE MATERIALS, SUCH AS PLASTICS AND FOR SOLDERING SOFT ALLOYS

Andrei Nikolaevich Shashkov, Lomonksovsky prospekt, 23, kv. 550; Jury Ivanovich Nekrasov, Novo-Rogozhskaya ul, 5, kv. 125; Leonid Petrovich Guskov, Boitsoraya ul. 10 Korp 8, kv. 43; Nina Lvovna Frolova, 3, Peschanaya ul, 1, kv. 139; Vladimir Nikoaevich Potapov, ul. Junykn Lenintser, 69, kv. 50, and Jury Konstantinovich Rodin, ul. Kolyaeva, 4, kv. 15, Moscow, U.S.S.R.

Filed Aug. 12, 1968, Ser. No. 752,038
Int. Cl. B05b 7/04
U.S. Cl. 239—405 2 Claims



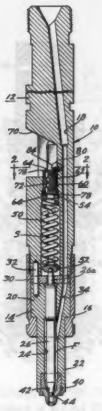
A gas torch comprises a hollow housing with channels for feeding combustible gas and air to a mixing chamber within the housing. Inside the housing and facing the channels is a nozzle communicating with the gas channel. The periphery of the nozzle is provided with spirallike projections disposed downstream of the air channel to effect primary eddying of the air. At the outlet end of the housing is an outlet nozzle and an additional vortex generator is disposed between the nozzles, the latter vortex generator being formed by threads on the inside walls of the housing.

3,567,133

PRESSURE ADJUSTING MEANS FOR FUEL INJECTION NOZZLES

Walter J. Gewinner, Springfield, Mass., assignor to Ambac Industries, Inc., Springfield, Mass.

Filed June 25, 1968, Ser. No. 739,878
Int. Cl. B05b 1/30
U.S. Cl. 239—533 5 Claims



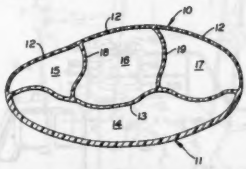
A fuel injection nozzle assembly comprising an elongated holder, a nozzle mounted at one axial end of the holder, a valve element mounted in an axial bore in the nozzle, means defining a spring chamber in said nozzle assembly for mounting therein a compression spring normally biasing the valve element to a closed position, pressure-adjusting means for said spring for selectively regulating the pressure at which the valve opens comprising an adjusting screw member mounted in a threaded axial bore in the holder engaging one end of said compression spring and a locking screw member engaging in a threaded opening extending transversely of said threaded axial bore adapted to engage said adjusting screw to lock the same in a predetermined adjusted position.

3,567,134

DUAL PURPOSE HOSE

Moyer W. Smith, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio

Filed Sept. 9, 1969, Ser. No. 856,356
Int. Cl. B05b 15/00
U.S. Cl. 239—547 6 Claims

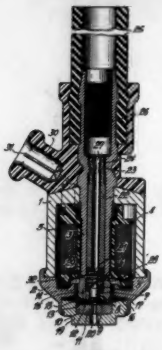


A flexible hose for selectively delivering fluid in different conditions, as for example, a stream of water for sprinkling or a multiplicity of fine jets or sprays for gradually soaking the soil. The hose has a flexible main partition wall with lateral partition walls extending therefrom to an adjacent perforate part of the outer hose wall. The main and lateral partition walls assume a substantially semicylindrical shape in conformance with the perforate part of the outer hose which is normally cylindrical when fluid is conducted along the opposite side of the main partition wall, and the main partition wall assumes a substantially flat shape and draws another part of the outer hose wall into substantial conformance therewith when fluid is conducted along the near side of the main partition wall, with the lateral partition walls forming separate compartments along said near side.

3,567,135
ELECTROMAGNETICALLY OPERATED FUEL INJECTION VALVE

Horst Gebert, Stuttgart-Feuerbach, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Jan. 24, 1969, Ser. No. 793,648
Claims priority, application Germany, Jan. 30, 1968, P1,601,395.9
Int. Cl. B05b *1/30*
U.S. Cl. 239—585 10 Claims

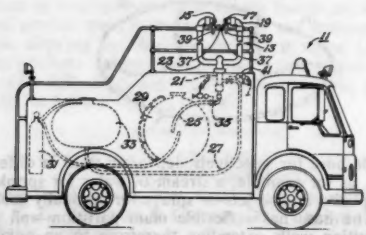


An electromagnetically operated fuel injection valve wherein the armature has an annular sealing surface surrounded by an annular chamber and is normally biased against the rear side of a nozzle. The chamber receives fuel by way of one or more channels which extend from the peripheral surface of the armature toward the bottom surface of the channel so that their projections into the plane of the sealing surface are tangential to the chamber. This causes fuel which enters the chamber to circulate therein whereby the magnitude of the axial component of movement of the fuel determines the rate at which the fuel enters the orifice of the nozzle when the electromagnet is energized to retract the armature from the nozzle.

3,567,136
FULLY ROTATABLE TURRET FOR DELIVERING PLURALITY OF FIRE EXTINGUISHING AGENTS

George A. Garrett, Fort Worth, Tex., assignor to Fire Control Engineering Company, Fort Worth, Tex.

Filed June 26, 1969, Ser. No. 836,697
Int. Cl. B05b *15/08*
U.S. Cl. 239—587 7 Claims

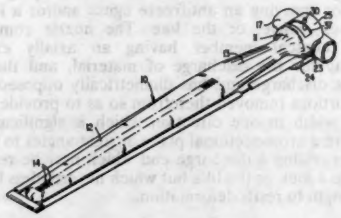


This specification discloses a turret for fire fighting equipment capable of delivering a plurality of fire extinguishing agents onto a fire, characterized by having a plurality of nozzle means connected respectively with a plurality of separate conduit means; a single support means adapted for effecting any segment of rotation, including 360° and more of rotation for the turret; and a plurality of concentric mounting and sealing means within the single support means. The concentric mounting and sealing means are each connected with respective ones of said conduit means to carry the respective fire extinguishing agents without admixing thereof and without entanglement of the respective conduit means. Also disclosed are specific elements; such as, the stationary external jacket serving as the single support means; the rotatable head; the respective conduit means; the swivel joints serving as the mounting and sealing means; the twin nozzles; and the disengageable locking means for effecting unitary operation of the twin nozzles, or allowing them to be operated separately.

3,567,137
GAS BURNER

Adrian V. Cavestany, Pasadena, and Harold R. Bissell, Jr., Hacienda Heights, Calif., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Aug. 29, 1969, Ser. No. 854,080
Int. Cl. B05b *1/20, 1/00*
U.S. Cl. 239—600 2 Claims



The open intake end of the gas burner body is contoured for arcuate abutting engagement of not more than 180° with the supply manifold. A pin extends upwardly from the manifold into a slot formed in the upper side of the burner end and extending in a direction transversely of the manifold. The pin and slot, in conjunction with the arcuate engagement, provide the sole means to position and maintain the burner in accurate registration with the manifold orifice. Upon partial rotation of the burner about the manifold, it may be manually removed from the manifold.

3,567,138
USE OF SCREENING FOLLOWING MICRONIZING TO IMPROVE TiO_2 DISPERSIBILITY

David P. Fields, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Feb. 8, 1968, Ser. No. 703,899
Int. Cl. B02c *13/00, 19/06, 19/12*
U.S. Cl. 241—5 2 Claims

TiO_2 pigments are specially prepared to give them ease of dispersion in organic media, especially plastics, by subjecting the dry pigment to fluid energy milling and then forcing the milled product through a screen.

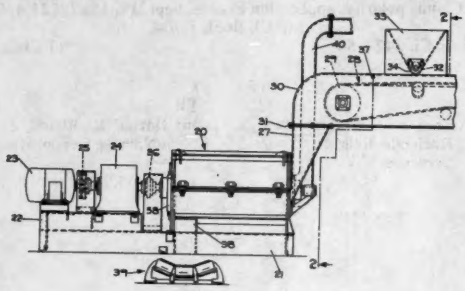
3,567,139
METHOD OF MULLING

Karl H. Andrae, Columbus, Ohio, assignor to Jeffrey Galion Manufacturing Company

Original application Dec. 27, 1963, Ser. No. 333,936, now Patent No. 3,430,874, dated Mar. 4, 1969. Divided and this application June 7, 1968, Ser. No. 735,393
Int. Cl. B02c *15/08, 21/00*
U.S. Cl. 241—17 5 Claims

Method of mulling material in which the material is continuously delivered to and discharged from a receptacle. The

material is dispersed in the receptacle and is distributed on the inner cylindrical mulling surface of the receptacle to be



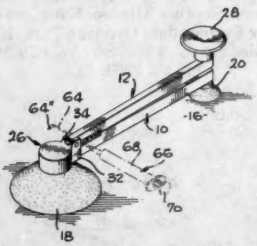
mulled on the mulling surface as the material continuously flows through the receptacle.

3,567,140

HYPODERMIC SYRINGE DESTRUCTION METHOD AND DEVICE THEREFOR

Melvin T. Paulson, 420 Eton Drive, Burbank, Calif. 91504

Filed Sept. 9, 1968, Ser. No. 758,232
Int. Cl. B02c *1/04, 19/12, 19/14*
U.S. Cl. 241—25 12 Claims



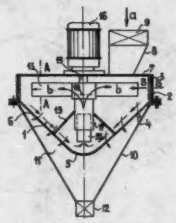
A method of and a manually operable destruction device for irreversibly disabling both the tubular metal needle portion and the pliable or rigid tubular plastic syringe portion of a disposable hypodermic syringe commonly known and referred to hereinafter as a hypodermic needle. A pair of pivotally connected levers have respective flat surfaces for flush engagement for irreversibly flattening the needle portion, and respective ridged surfaces for engaging the syringe portion and irreversibly deforming it so as to disable its fluid containment function as by creating an aperture therein. A pin projects from one of the levers adjacent its ridged surface for stopping and holding relatively large syringe portions against rolling out of the ridged surface region during deformation, and has a sharp point for piercing an overlapping bulge of a syringe portion caused by deformation. Interchangeable mounting means are provided for removable securement of the device to a surface of a table or counter.

3,567,141

MILL FOR GRINDING HARD MATERIALS

Olbracht Sylvester Zbraniborski; Henryk Zielinski, and Helmut Kilian Skiba, Zabrze, Poland, assignors to Instytut Chemicznej Prezerobki, Wegla, Zabrze, Poland

Filed July 22, 1968, Ser. No. 746,536
Claims priority, application Poland, July 25, 1967, P121,870
Int. Cl. B02c *19/00*
U.S. Cl. 241—48 4 Claims



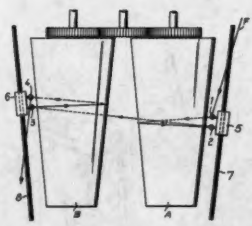
A mill for grinding material in which a rotating element throws the material against a hard lining element, the material being circulated over a separating screen spaced from the lining element and thence back to the rotating element.

3,567,142

DEVICE FOR ADJUSTING THE TENSION OF YARN FED TO A YARN COMSUMING MACHINE

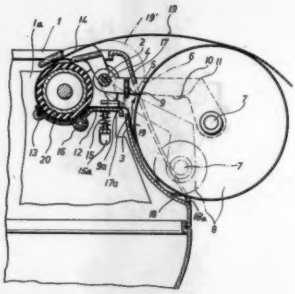
Bernard-Francois Helffer, Les Vergers, France; Jean-Pierre A. Raisin, Troyes, and Eugene J. Voisin, Les Verges, France, assignors to Institut Textile De France, Boulogne S, Seine, France

Original application May 17, 1966, Ser. No. 550,715, now Patent No. 3,451,603, dated June 24, 1969. Divided and this application Feb. 18, 1969, Ser. No. 800,207
Int. Cl. B65h *51/08*
U.S. Cl. 242—47.08 5 Claims



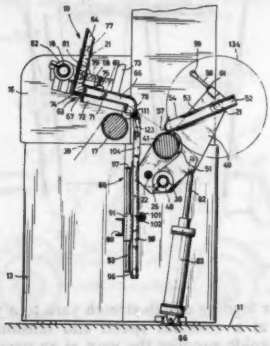
A device for feeding a high-stretch yarn to a yarn-consuming machine at a constant speed and tension in which a delivery yarn guide supplies the yarn at an uncontrolled tension to a pair of rollers driven at different speeds over which the yarn is looped, which rollers impart to the yarn a constant speed and a tension which is higher than the decrimping tension and subsequently ease the imparted tension so that the yarn assumes a hysteresis characteristic relative to the stretch/load curve of the yarn produced by the application of the imparted tension so as to achieve a delivery tension but which may be varied without the production of appreciable variation in length of the yarn.

3,567,143
PAPER GUIDING ARRANGEMENT FOR A BUSINESS MACHINE
Alfred Hesse, and Karl-Heinz Rosing, Wilhelmshaven, Germany, assignors to Olympia Werke A G, Wilhelmshaven, Germany
Filed Nov. 12, 1968, Ser. No. 775,003
Claims priority, application Germany, Nov. 25, 1967, O12903
Int. Cl. B41j *15/04*; B65h *19/00*
U.S. Cl. 242—55 10 Claims



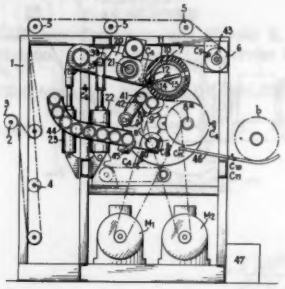
A paper roll supplies a paper band through an inlet opening in the housing of a business machine to a platen which transports the paper band back towards the top of the paper roll. When the diameter of the paper roll is small, the paper band is curved and tends to reenter the inlet opening which is prevented by a closure means mounted on the carrier of the paper roll and substantially closing the inlet opening when the carrier is displaced due to the reduction of the diameter of the paper roll.

3,567,144
APPARATUS FOR WINDING SHEET MATERIAL
Jurgen Dambroth, Landesgut Wienebuttel, Germany, assignor to Famatex G.m.b.H., Postfach, Germany
Filed Jan. 14, 1969, Ser. No. 790,934
Claims priority, application Germany, Jan. 19, 1968, 1,710,576
Int. Cl. B65h *35/04*
U.S. Cl. 242—56 25 Claims



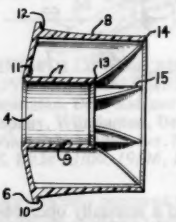
Two parallel spaced rollers form a nip or seat in engagement with which the sheet material is wound on a roll rod. A roll rod guide is at each end of the roller pair and is pivotable with the downstream roller to move a roll rod between a rolling position in the nip, a cutting position and a discharge position. Moveable cutting means are coupled to the roller drive and cut the sheet in the vicinity of the nip.

3,567,145
METHOD AND APPARATUS FOR WINDING UP SUCCESSIVE SEGMENTS OF A CONTINUOUSLY DELIVERED STRIP
Michel Ernoult, Croix, and Pierre Pennel, Wasquehal, France, assignors to Les Plastiques De Roubaix and Anciens Etablissements Repiquet, Bobigny, France
Filed Sept. 18, 1968, Ser. No. 760,631
Claims priority, application France, Sept. 19, 1967, 121,430
Int. Cl. B65h *35/04*
U.S. Cl. 242—56 11 Claims



A strip-winding machine for winding on mandrels segments cut from a continuously delivered strip of material, the strip being cut at the end of the winding on a given mandrel by means of a blade carried by a movable blade carrier, which is applied onto a rotating empty mandrel into the surface of which the blade can penetrate, so that at the end of the cutting the transverse leading edge of the strip is automatically pressed by the blade against the surface layer of the mandrel, ensuring the initiation of the winding on the empty mandrel by maintaining for a short time the strip clamped between the mandrel and the movable blade carrier.

3,567,146
END CORE FOR ROLLS OF PAPER
Herbert Arenson, Shawnee Mission, Kans., assignor to United States Caster Corporation, Overland Park, Kans.
Filed June 2, 1969, Ser. No. 829,311
Int. Cl. B65h *75/02*
U.S. Cl. 242—68.6 8 Claims



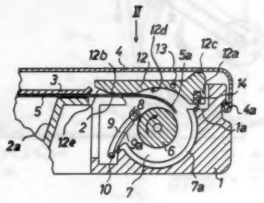
An end core for mounting in opposite ends of a roll of paper for rotatably supporting same has concentric inner and outer substantially cylindrical walls connected at one end by an end wall with a portion extending beyond the outer wall to form an annular flange. The end wall, flange and inner and outer walls have a radial slot extending longitudinally of the core. Reinforcing members are circumferentially spaced and extend radially between the inner and outer core walls with a pair of the reinforcing members being in facing relation with facing surfaces aligned with the slot. The core structure and slot permit contraction for insertion into a roll of paper and then expansion of the core into tight engagement with the inner convolution of the paper roll.

3,567,147

PHOTOGRAPHIC APPARATUS WITH AUTOMATIC FILM THREADING MECHANISM

Dieter Engelsmann, Unterhaching; Rolf Schroeder, and Heinz Ernst, Munich, Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 6, 1969, Ser. No. 797,023
Claims priority, application Germany, Feb. 14, 1968, P 16 22 173.1
Int. Cl. G03b *1/04*
U.S. Cl. 242—71.1 **17 Claims**



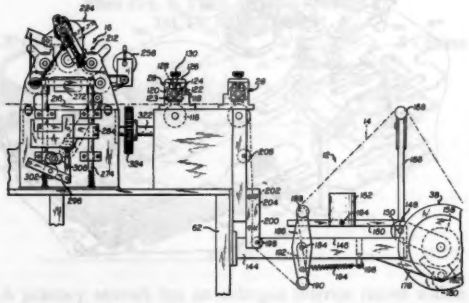
A still camera wherein the inlet of the takeup chamber is adjacent to the discharge end of a film channel. A two-armed lever is pivotally mounted in the camera body behind the takeup chamber so that one of its arms defines with the discharge end of the channel a narrow gap for automatically directing the leader of roll film toward and through the inlet of the takeup chamber. The latter accommodates a rotary takeup reel and a deflecting device which causes the leader to convolute itself around the reel in response to actuation of the film transporting mechanism.

3,567,148

CONSTANT TENSION PAPER SUPPLY MECHANISM

Gerald J. Ottavan, Ridgefield, N.J., assignor to Allamatic Corporation, Cliffside Park, N.J.

Filed June 13, 1968, Ser. No. 736,768
Int. Cl. B65h *77/00*
U.S. Cl. 242—75.43 **6 Claims**



A paper supply mechanism especially adapted for supplying pressure sensitive adhesive backed label material, which supply mechanism includes a constant tension means comprising a self-adjusting brake which compensates for loss of paper roll mass, and a tension indicating means.

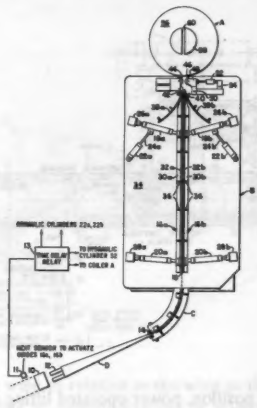
3,567,149

AUTOMATIC STRIP COILER

Calvin C. Williamson, Costa Mesa, Calif., assignor to Soule Steel Company, San Francisco, Calif.

Filed Oct. 16, 1968, Ser. No. 767,947
Int. Cl. B21c *47/04, 47/32*
U.S. Cl. 242—78.1 **4 Claims**

An automatic strip coiler with a twist guide for turning the strip on edge and into an elongate strip guide. The strip guide is openable to form a looping box. The coiler has a rotating flywheel table with a split drum mounted thereon. An infrared sensor connected to a time delay mechanism opens the guide chutes to form a looping box when the strip end enters the split drum. At the same time, the flywheel table accelerates the split drum to commence winding the strip.

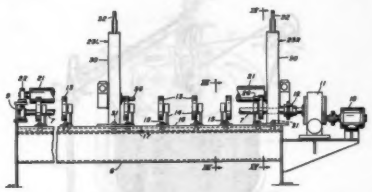


3,567,150

BUNDLE TIGHTENER

John F. Nelson, Concord, Calif., assignor to United States Steel Corporation

Filed Mar. 7, 1969, Ser. No. 805,215
Int. Cl. B21c *47/02*
U.S. Cl. 242—78.1 **14 Claims**



Apparatus for tightening a bundle of flexible steel mat by applying torque to its center as it is wound by rolling on a supporting cradle so that successive convolutions of the mat will be snugly engaged about the bundle, the torque being applied by members that have gripping engagement with opposite edges of the mat at the center of the bundle. The gripping members which apply the torque are rotated by rotary air motors that form part of a mechanical drive and are mounted for vertical floating movement so that they move upwardly with the center of the bundle as its vertical spacing with respect to the supporting cradle increases with the diameter of the bundle. Provision is made for increasing the torque developed by the air motors as the bundle increases in size, this being accomplished by a vertical cam which operates a control valve to increase the pressure of the air supplied to the motors as the torque applying members move upwardly with the center of the bundle.

3,567,151

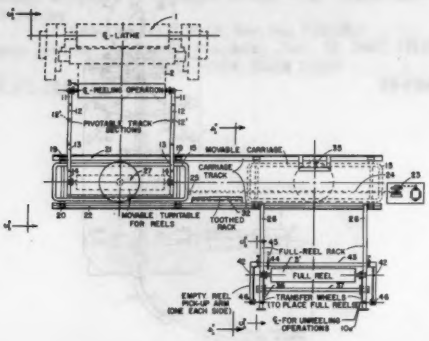
HANDLING SYSTEM FOR VENEER REELS

Allan E. Williams, Mellen, and Royal C. Cady, Highbridge, Wis., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed June 12, 1969, Ser. No. 832,806
Int. Cl. B21c *47/24*
U.S. Cl. 242—79 **11 Claims**

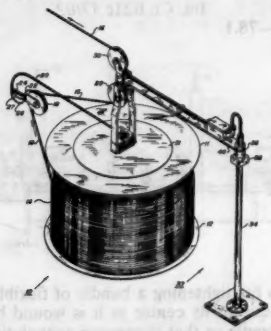
An automatical operating track and conveyor system for handling wood veneer reels. The system includes a turntable

on a laterally movable carriage such that a full reel may be turned 180° for suitable "unreeling" positioning, power operated transfer wheels for lifting a full reel into the final



"unreeling" position, power operated lifting arms for moving empty reels onto an empty track, and means to convey and return an empty reel back to the "reeling" position for receiving veneer from the log cutting lathe.

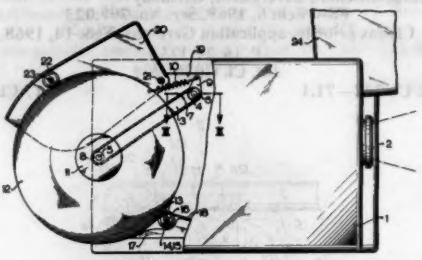
3,567,152
UNREELING MECHANISM FOR WIRE AND TUBING
Raymond A. Heisler, 657 Dakota Trail, Franklin Lakes, N.J.
Filed Sept. 9, 1969, Ser. No. 856,301
Int. Cl. B65h *49/00*
U.S. Cl. 242—128 **10 Claims**



An unreeling mechanism adapted to permit determined lengths of tubing, wire and the like to be intermittently drawn from a supply reel while retaining the remaining coils on the reel in their wound condition. A feeding arm is disposed to rotate around a support, and is adapted to receive the strand from the coil and in response to the tension in the strand being delivered, disengages a brake so as to permit the feeding arm to rotate around the reel. There is additionally provided an automatic shutoff switch which is actuated by an excessive pull on the delivering strand to cause a shutdown of the processing line and/or a signal to be actuated.

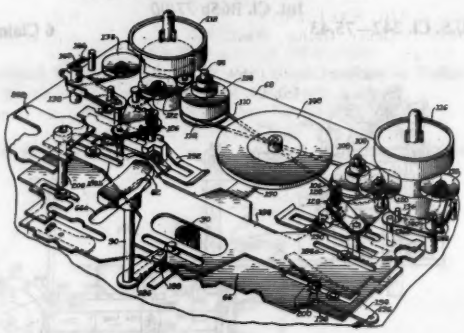
3,567,153
WINDING DEVICE FOR TAPES
Dietrich Becker; Fritz Krumbein, Stuttgart-Moehringen, and Gerhard Boerner, Boeblingen, Germany, assignors to Zeiss Ikon Aktiengesellschaft, Stuttgart, Germany
Filed Jan. 23, 1969, Ser. No. 793,286
Claims priority, application Germany, Feb. 17, 1968, P 15 74 644.8
Int. Cl. B65h *59/38;* **G03b** *1/04;* **G11b** *15/32*
U.S. Cl. 242—186 **5 Claims**

A tape winding device for picture projecting, picture producing, sound recording and sound reproducing apparatus in which the tape is always moved with uniform speed regardless of the diameter of the tape spool on the winding core. This is accomplished by a friction clutch



operatively connected with the drive of the winding core in such a manner that the frictional power of the friction clutch is gradually increased with the increasing diameter of the tape spool forming on said winding core.

3,567,154
TAPE RECORDER
Gordon E. Bradt, Wilmette; John W. Hipelius, Skokie; Leslie W. Johnson, Chicago; Zbigniew Mychal, Chicago, Ill., and George B. Shields, Waltham, Mass., assignors to Bell and Howell Company, Chicago, Ill.
Filed June 19, 1968, Ser. No. 738,274
Int. Cl. B65h *63/02;* **G11b** *15/32*
U.S. Cl. 242—190 **21 Claims**



The disclosed tape recorder has a program mechanism for automatic preselection of the tape play cycle to provide forward, forward-reverse and continuous playing of the tape between the storage reels.

A primary control slide is shifted to either side of a neutral position by drive means that is powered from a unidirectional motor. Drive members at opposite ends of a center pivoted, rotatable rocker arm are alternatively pivoted upwardly into a plane of engagement with the control slide according to a desired direction of movement of the slide.

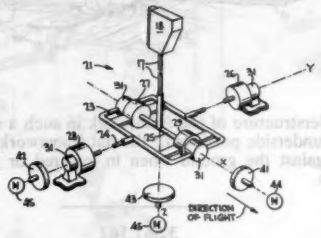
A manually operable selector knob is rotated in opposite directions from a center position to initiate tape transport in the selected direction after which it is promptly restored to its center position by control mechanism of the recorder. Mere depression of the selector knob places the recorder in a neutral or quiescent condition regardless of the programmed operating mode.

3,567,155

GRAVITY GRADIENT ATTITUDE CONTROL SYSTEM

James A. Gatlin, Bowie; Henry C. Hoffman, Baltimore; Henry W. Price, College Park, and Benjamin G. Zimmerman, Forest Heights, Md. Administration the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Dec. 20, 1968, Ser. No. 785,620
Int. Cl. B64g 1/00
U.S. Cl. 244—1 11 Claims



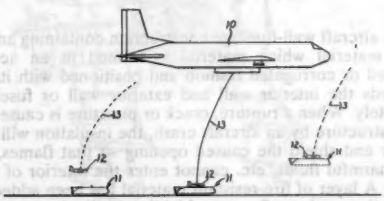
A system for controlling and stabilizing the attitude of an artificial earth satellite includes a gravity gradient member mounted in a gimbal arrangement to have 2° of freedom. The angular deviation of the gravity gradient member and the satellite relative to the local vertical and the spacecraft angle command input signal selectively drive a plurality of inertial momentum wheels, one for each of the three spacecraft axes, provided to dampen the gravity gradient member librations. The gravity gradient member is controlled so that the equilibrium position of the longitudinal axis thereof is maintained in alignment with the local vertical in response to signals indicative of the rate of change of movement thereof with respect to the remainder of the satellite and a signal indicative of the angular deviation of the satellite position from the angle command.

3,567,156

AIRCRAFT AND VEHICLE COMBINATION

Davis L. Bauer, Hatton, Wash. (Star Route, Connell, Wash., 99326)

Filed Oct. 9, 1969, Ser. No. 865,025
Int. Cl. B64d 5/00
U.S. Cl. 244—2 8 Claims



A primary aircraft has an enlarged interior recess within which one or more surface vehicles can be received. Reception of surface vehicles is accomplished during flight of the primary aircraft. The surface vehicles are selectively attached to a secondary aircraft suspended by cable and retrieved into the primary aircraft along with the vehicle.

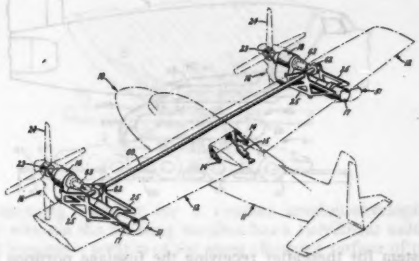
3,567,157

AIRCRAFT PROPULSION MOUNTING ARRANGEMENT

Paul J. Dancik, Broomall, Pa., assignor to The Boeing Company, Seattle, Wash.

Original application Dec. 30, 1966, Ser. No. 606,310, now Patent No. 3,439,888, dated Apr. 22, 1969. Divided and this application Dec. 11, 1968, Ser. No. 798,842
Int. Cl. B64c 29/00, 27/28
U.S. Cl. 244—7 10 Claims

A v/STOL aircraft having a wing and propulsion mounting arrangement wherein a propulsion unit is secured to a rotatable wing, which wing is capable of moving between a substantially vertical position and a substantially horizontal position. The propulsion unit, in turn, is adapted to move in conjunction with the wing or relative to the wing so that the wing and the engine may be rotated together or separately during transition from vertical to forward flight and vice versa.

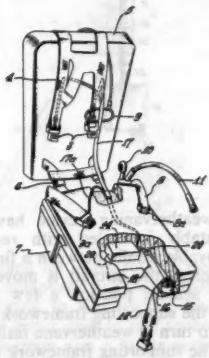


3,567,158

AUTOMATIC SYSTEM

Jan R. Coyle, San Dimas, Calif. (P. O. Box 297, Milford, Utah 84751)

Filed Feb. 19, 1969, Ser. No. 800,486
Int. Cl. B64d 25/10
U.S. Cl. 244—122 9 Claims



An automatic system in which a device is automatically actuated upon immersion of a water activated switch.

Such a system which is energized by a normally inactive battery.

Such a system in which the device is a canopy release buckle.

3,567,159

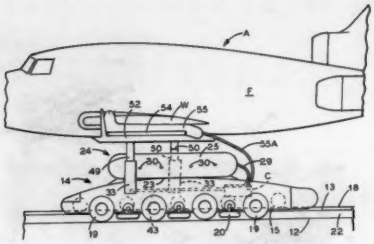
EMERGENCY AIRCRAFT LANDING DEVICE

Larry Klein, 3856 Bronx Blvd., Bronx, N.Y. 10467

Filed Oct. 31, 1968, Ser. No. 772,147
Int. Cl. B64f 1/00
U.S. Cl. 244—114 3 Claims

A landing device for emergency use by aircraft having damaged or inoperable landing gear wherein a vehicle or buggy is propelled along a given path for receiving the air-

craft, together with a first cushion system for initially receiving the wing portions of the aircraft and a second cushion system for thereafter receiving the fuselage portions of the aircraft in a transfer operation from the first cushion system.



3,567,160

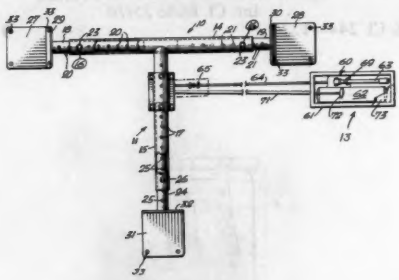
AIRCRAFT WEATHERVANING DEVICE

Earl G. Adams, 2130 N.W. 13th St., Fla., and Edmund L. Eveleth, 10901 S.W. 180th St., Miami, Fla. 33157

Continuation-in-part of application Ser. No. 656,533, July 27, 1967. This application Apr. 3, 1969, Ser. No. 813,253

Int. Cl. B64f *1/12*

U.S. Cl. 244—115 6 Claims



An aircraft weathervaning device having a supporting framework rotatably journaled with respect to a fixed cylinder and movable axially between a first position against the ground, whereat the aircraft is moved into place and secured, and a second position a few inches above the ground whereat the supporting framework, together with the aircraft, is free to turn in weathervane fashion always to face into the wind. The supporting framework is in the form of a T-bar having adjustable arms terminating in wheel pads adapted to receive and have lashed thereto the wheels of a tricycle landing gear. The T-bar supporting framework can readily be modified into an H-bar configuration for supporting a circular deck to accommodate movable wing aircraft.

3,567,161

WEATHERVANING TIE-DOWN DEVICE FOR AIRCRAFT

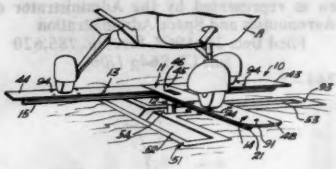
Earl G. Adams, 2130 N.W. 13th St., Fla., and Edmund L. Eveleth, 10901 S.W. 180th St., Miami, Fla.

Continuation-in-part of application Ser. No. 813,253, Apr. 3, 1969. This application June 17, 1969, Ser. No. 834,120

Int. Cl. B64f *1/12*

U.S. Cl. 244—115 10 Claims

A weathervaning tiedown device for tricycle landing gear light aircraft is described, comprising an aircraft supporting framework and mechanism for elevating and lowering the supporting framework between a position at ground level, whereat an aircraft can be moved into place for tie down, and an elevated position, whereat it is free to rotate with the weathervaning aircraft. The supporting framework comprises a flat T-shaped deck for placement for tie down of the aircraft. The elevating mechanism comprises a foundation in the form of a below-level trough receivable within which is the understructure of the framework in such a manner as to permit underside portions of the flat framework deck to rest flush against the ground when in lowered or ground level position.



3,567,162

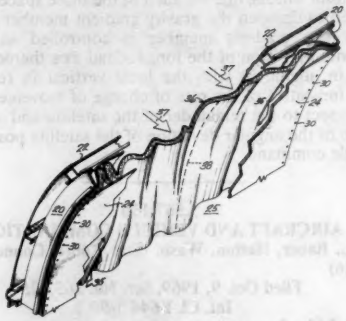
FIRE STOP INSULATION

James M. Lea, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 9, 1968, Ser. No. 783,461

Int. Cl. B64c *1/10*

U.S. Cl. 244—121 2 Claims



An aircraft wall-fuselage construction containing an insulation material which material is formed in an accordion pleated or corrugated fashion and positioned with its ridges towards the interior wall and exterior wall or fuselage alternately. When a rupture, crack or puncture is caused in the wall structure by an aircraft crash, the insulation will unfold, cover and shield the caused opening so that flames, smoke and harmful fluids, etc. cannot enter the interior of the aircraft. A layer of fire-resistant material has been added to the insulation so that a fire-stop shielding quality is obtained.

3,567,163

GUIDANCE SYSTEM

Robert B. Kepp, Orlando, Fla., and Raymond C. Shreckengost, Rockville, Md., assignors to Martin-Marietta Corporation, Middle River, Md.

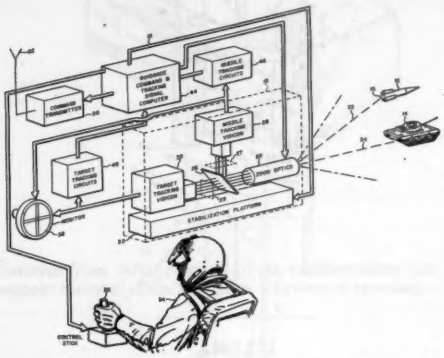
Filed Oct. 8, 1964, Ser. No. 402,661

Int. Cl. F41g *7/10*

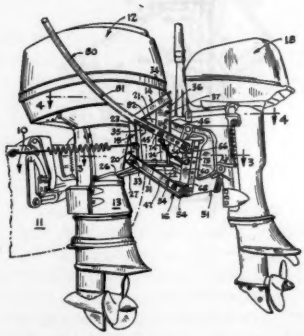
U.S. Cl. 244—3.14 14 Claims

A missile guidance system comprising an optical system for receiving spectral energy from both a target and a missile, said optical system having an optical boresight axis, means in said optical system for separating target spectral energy from missile spectral energy, a target camera tube coupled to said optical system for developing an electrical signal representative of said target energy, a missile camera tube coupled to said optical system for developing an electrical signal representative of said missile energy, a TV monitor, means for feeding both said target energy signal and said missile

energy signal to said TV monitor, a target tracking circuit for developing a difference signal representative of the difference in the line of sight position of said target from said boresight axis, means coupling said target energy signal to said target tracking circuit, a missile tracking circuit for developing a difference signal representative of the difference in the line of sight position of said missile from said boresight axis, means coupling said missile energy signal to said missile tracking circuit, means for comparing said difference signals to produce an error signal, and means for transmitting said error signal as a correction signal to said missile.



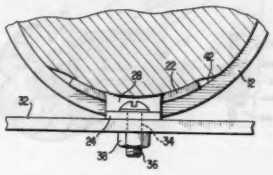
3,567,164
OUTBOARD MOTOR SUPPORT
Ruben V. Hakala, Waukegan, Ill., assignor to Henry J. Schueneman
Filed Feb. 10, 1969, Ser. No. 797,859
Int. Cl. B63h *21/26*
U.S. Cl. 248—4 **3 Claims**



An outboard motor support means which is particularly adapted for attachment to a primary outboard motor mounted on a boat transom and which has a fixed support section with a movable support section pivotally mounted thereon having means for supporting an outboard motor, and with the movable support section having a lever means extending forwardly toward the boat for pivotally moving the movable support section, thereby effecting vertical movement of the outboard motor into or out of the water. A latch means is also provided for holding the movable support section and the outboard motor in a selected vertical position.

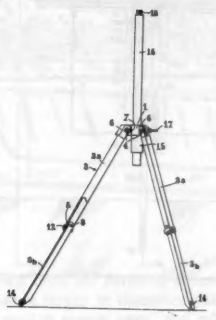
Spring means are also preferably provided which connect the opposite sides of the fixed support section of the outboard motor support means to the opposite end portions of the boat transom to automatically center the outboard motor mounted thereon when the steering mechanism is unattended and maintain the boat traveling along a straight course.

3,567,165
SECURING MEMBER FOR A CLAMP
James C. White, P. O. Box 5454, Greenville, S.C. 29606
Filed Dec. 20, 1968, Ser. No. 785,598
Int. Cl. F16l *3/14*
U.S. Cl. 248—68 **4 Claims**



A securing member for a circular conduit-enveloping clamp wherein the securing member has a curvilinear saddle which engages a portion of the inner clamping surface of the clamp and a pair of leg portions integrally formed with the saddle and extending from opposed side edge portions thereof in a first downwardly and subsequently outwardly direction therefrom such that the leg members engage the surface onto which the clamp is to be secured, and an aperture in one of the leg members for receiving a fastener.

3,567,166
STENOTYPE TRIPOD
Francoise Grandjean, Paris, France, assignor to Stenotype Grandjean, Societe Anonyme, Paris, France
Filed Feb. 15, 1968, Ser. No. 705,768
Claims priority, application France, Nov. 20, 1967, 128,844
Int. Cl. F16m *11/38*
U.S. Cl. 248—170 **1 Claim**

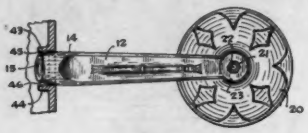


A detachable stand for supporting a machine such as a stenotype, which comprises a socket, fastening means for securing the stenotype to said socket, three legs pivotally connected by their upper ends to said socket, each leg comprising an upper section and a lower section consisting of channel elements having their aperture facing inwards and pivotally interconnected so that they can assume, in an operative position of said stand, either a first position in which said pair of leg-forming sections are in mutual alignment and such that when said stand is placed on the floor the stenotype is at a proper level for an operator sitting on a chair, or another position in which said lower section is folded into said upper section and such that when said stand is placed on a table, the stenotype is at a proper height for a standing operator.

3,567,167
FREELY ENGAGEABLE SUPPORT MEMBER
Walter Koziol, Russell, Ill., assignor to Charmglow Manufacturing Company, Antioch, Ill.
Filed Jan. 28, 1969, Ser. No. 794,500
Int. Cl. A47g *29/00;* **A47f** *5/00*
U.S. Cl. 248—223 **3 Claims**

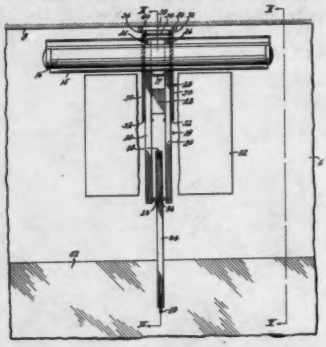
A freely engageable support member which can be inserted and retained in a hole by means of an engaging end

with a lip insertable in the hole and contacting the inner adjacent wall surface of the hole while a center section of the engaging end rests by weight of gravity in the hole and on a portion of the wall forming the lower part of the hole. An outer flange extends downwardly from the center section and



contacts the outer surface of the wall adjacent the hole, the lip and the flange preventing the support from falling outwardly when placed in the hole with the support having an object attached to its end opposite the engaging end, the weight of which causes the lip and flange to contact the inner and outer sides of the wall surrounding the hole.

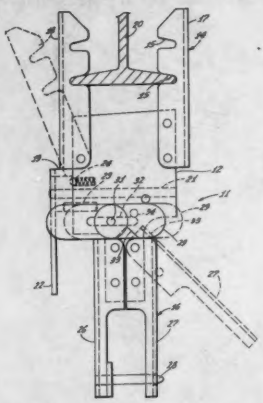
3,567,168
OVERHEAD PROJECTION SCREEN HOLDER
Ambrose M. Jennings, Box 176, Basehor, Kans.
Filed Sept. 11, 1968, Ser. No. 759,109
Int. Cl. G03b *21/56*
U.S. Cl. 248—284 **8 Claims**



A holder for mounting a projection screen against a wall in such a manner that the top of the screen may be moved outwardly from said wall to incline the screen, said holder consisting of an arm adapted to lie vertically against a wall, a link pivoted at its upper end to said wall above said arm, and at its lower end to the midpoint of said arm, on horizontal axes parallel to the wall, whereby said arm may be inclined outwardly from the wall with its lower end engaging the wall, the upper edge of the screen being attached to the upper end of said arm, and a generally vertical bar attached to the lower end of said arm and extending downwardly therefrom, whereby said arm may be manipulated, the lower edge of said screen being attachable to the lower end of said bar.

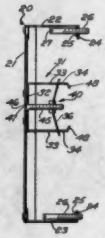
3,567,169
CONNECT-DISCONNECT FIXTURE
Thomas M. Frederick, Palos Verdes, and Leslie W. Baxter, Cypress, Calif., assignors to Northrop Corporation, Beverly Hills, Calif.
Filed Jan. 12, 1970, Ser. No.
Int. Cl. B66d *3/00*
U.S. Cl. 248—317 **4 Claims**

An attach-detach fixture including means enabling the fixture to be releasably secured to overhead structure while retaining large components such as plates, panels etc. thereon in a releasable, suspended and locked relation including means precluding the possibility of electrolytic action



between components carried by the fixture and overhead structure to which the fixture is attached.

3,567,170
BRACKET FOR MOUNTING A DISPLAY SCREEN
Percy Frederick Albee, Jr., Barrington, and Eric Scott, Lincoln, R.I., assignors to Q-Panel Corporation
Filed Dec. 11, 1968, Ser. No. 783,018
Int. Cl. A47g *1/16*
U.S. Cl. 248—475 **4 Claims**

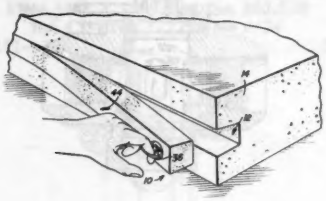


A bracket having legs to engage a wall or other substantially vertical surface with jaws intermediate the legs which grip a map rail on a blackboard or any protrusion such as moldings that project from a wall surface including means to provide a rigid base for mounting a screen or similar visual display.

3,567,171
KEY FORM
Robert L. Slominski, Point Mountain Road R.D. 2, Washington, N.J. 07882
Filed July 11, 1968, Ser. No. 744,077
Int. Cl. E01c *11/04*
U.S. Cl. 249—9 **4 Claims**

A key form for concrete made of a flexible plastic composition and employed to form a keyway or depression in poured concrete. Removal of the form is facilitated by means

of handles flush in the form. A method for forming a keyway includes the nailing of the key form to an inward surface of a



concrete form. After removal of the concrete form and subsequent removal of the key form, a keyway is revealed.

3,567,172

STAIRCASE UNIT AND MOULD FOR MAKING SAID UNIT

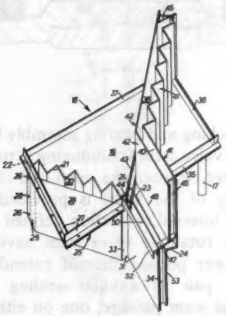
John Desmond Peacock, Gerrards Cross, and Ian Sim Wilson, Oakley Green, near Windsor, England, assignors to Concrete Limited

Filed May 20, 1968, Ser. No. 730,347

Claims priority, application Great Britain, Apr. 26, 1968, 20069/68

Int. Cl. B28b 7/22

U.S. Cl. 249—14 **8 Claims**



The present invention relates to mould means for making a precast staircase unit comprising an integral assembly of two staircase flights, a half-landing and a supporting spine wall.

3,567,173

CORE MANDREL FOR MAKING HOLLOW PLASTIC BODIES

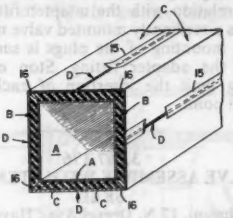
Fred D. Peterson, San Mateo, Calif., assignor to Peterson Products of San Mateo, Inc., Belmont, Calif.

Filed June 16, 1967, Ser. No. 646,588

Int. Cl. B29c 1/12

U.S. Cl. 249—183 **4 Claims**

A mandrel for use in making hollow reinforced plastic parts, which diametrically shrink during the curing cycle. The mandrel has an inner rigid core structure around which is laminated a thick layer of foam rubber to which is bonded sections of aluminum foil with their adjoining edges separated by longitudinal gaps to act as expansion joints and permit the metal sections to move closer together under influence of the diametral contraction of the plastic during its curing cycle.



3,567,174

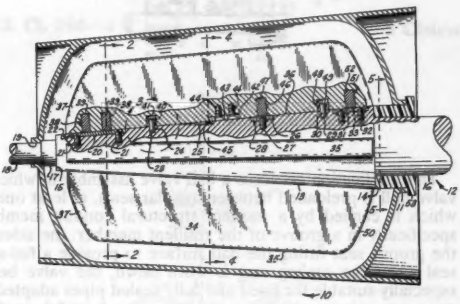
BREAKDOWN CORE FOR FORMING A CAVITY IN A SOLID PROPELLANT GRAIN

Garland K. Grace, Huntsville, Ala., assignor to Thiokol Chemical Corporation, Bristol, Pa.

Filed Mar. 18, 1968, Ser. No. 713,634

Int. Cl. B29c 1/00

U.S. Cl. 249—186 **1 Claim**



A breakdown core for forming a cavity in a solid propellant grain, that is larger in diameter than the opening in the aft end of a rocket motor case, and wherein the core comprises a body and a plurality of vanes or fins that are selectively connected to the body by the utilization of permanent magnets.

3,567,175

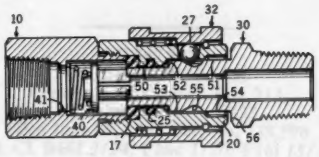
QUICK RELEASE COUPLING

Joseph S. Sciuto, Jr., Crestwood, Mo., assignor to Stile-Craft Manufacturers, Inc., St. Louis, Mo.

Filed Oct. 8, 1968, Ser. No. 765,854

Int. Cl. F16l 37/28

U.S. Cl. 251—149.6 **11 Claims**



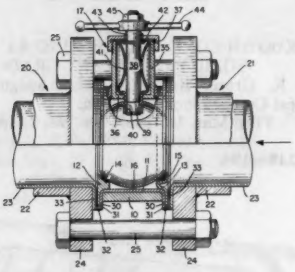
This fluid system coupling includes a stepped female adapter fitting, socket portions of successively increasing diameter adapted to accommodate interchangeable male

plugs of different size. The plugs, which include stepped nose and tail sections, are sealed by the same O-ring. A detent ball-locking means is provided which locks either of the plugs into coupled relation with the adapter fitting. The adapter fitting includes a resiliently mounted valve means actuated by the plug. The mounting of the plugs is such as to preclude tilting within the adapter fitting. Stop means within the adapter fitting limit the insertion of each plug beyond a predetermined point.

3,567,176
BALL VALVE ASSEMBLY WITH STEM ACTUATOR SEAL

Herbert G. Johnson, 17 N. Drexel Ave., Havertown, Pa. 19083

Filed Dec. 20, 1968, Ser. No. 785,662
Int. Cl. F16k *5/14*
U.S. Cl. 251—174 **7 Claims**



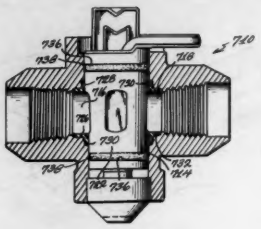
This application discloses a ball valve assembly in which a valve ball is preloaded between annular seals, at least one of which is carried by a resilient structural conduit member, specifically in a groove of the resilient member, the sides of the groove seat fitting the ball surface to provide a fail-safe seal when the sealing ring is worn down, the valve being especially suitable for lined and fully sealed pipes adapted to carry corrosive, radioactive, or otherwise harmful or dangerous fluids and having a fully sealed valve operator which is preferably urged tight by internal fluid pressure.

3,567,177
ROTARY PLUG VALVE

Frank H. Mueller, Decatur, Ill., assignor to Mueller Co., Decatur, Ill.

Original application Apr. 3, 1967, Ser. No. 627,832, now Patent No. 3,467,356, which is a division of application Ser. No. 328,731, Dec. 6, 1963, now Patent No. 3,333,812.
Divided and this application May 27, 1969, Ser. No. 828,309
Int. Cl. F16k *5/16*
U.S. Cl. 251—188 **8 Claims**

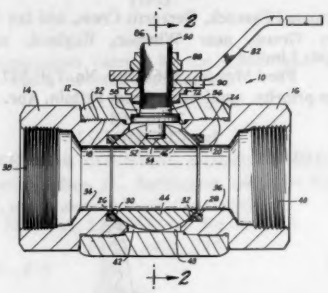
A tapered rotary plug valve having a resilient rubberlike cover secured to the circumference of an axial section of the valve seat surrounding the seat port so as to contact the opposed surface of the valve plug.



3,567,178
VALVE STEM PACKING AND BEARING ASSEMBLY

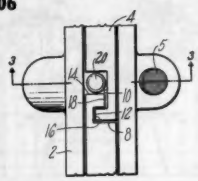
Norman A. Nelson, Houston, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Sept. 29, 1969, Ser. No. 861,745
Int. Cl. F16k *41/16*; **F16j** *15/10*
U.S. Cl. 251—214 **9 Claims**



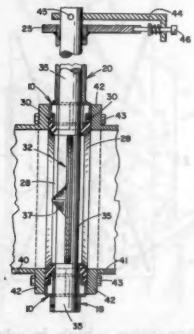
A valve stem packing and bearing assembly for plug valves having a rotatable valve stem for inducing actuation of an internal valve element between the open and closed positions thereof. The body of the valve is provided with a stem passage having an internal restriction defined by an annular internal flange. A rotatable valve stem having a shoulder defined at the lower portion thereof extends through the stem passage. A pair of annular sealing members are disposed within the stem passage, one on either side of the annular internal flange and serve to establish seals between the valve stem and the stem passage portion of the valve body and to serve as thrust bearings. The sealing members are deformed upon assembly from originally flat cross-sectional configuration to a tapered configuration that causes pressure acting from within the valve to urge both of the seals in a direction tending to increase the sealing ability thereof.

3,567,179
BUTTERFLY VALVE SEALING MEANS WITH INTERLOCKING MECHANISM
Edward W. Radtke, Bloomfield, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.
Filed Mar. 3, 1969, Ser. No. 803,538
Int. Cl. F16k *1/22;* **F16j** *9/24*
U.S. Cl. 251—306 **5 Claims**



An improved butterfly seal is provided by the combination of a split ring or piston ring type seal disposed in the groove around the periphery of a butterfly disc, the ring preferably having means for interlocking its ends, and a pin disposed radially in the disc periphery and protruding outwardly from the groove and into the interlocking means of the ring or into a space between the ends of the ring or into a space in the ring to prevent rotation of the ring in the disc groove.

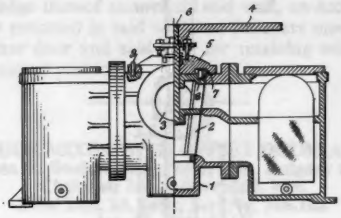
3,567,180
FABRICATED VALVE AND METHOD OF MAKING THE SAME
Hubert L. Williams, Hinsdale, Ill., assignor to Crane Co., Chicago, Ill.
Filed Sept. 19, 1969, Ser. No. 859,412
Int. Cl. F16k *1/22;* **B21d** *51/00*
U.S. Cl. 251—306 **7 Claims**



This invention relates to a fabricated hollow annular body for use as a valve body or the like and to a method of producing the same. The valve body is formed by one or more stamping operations on a piece of metal to form a half section which is annular or ring like in form. Two such half sections are placed in back to back relation and welded together to form the hollow annular valve body. Journalling members are welded in place on the valve body and a valve shaft carrying a valve disc is mounted by the journalling members for rotation.

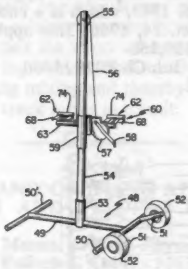
3,567,181
MEANS FOR FACILITATING THE ASSEMBLY OF PLUG VALVES
Frederick Kraissl, Jr., 244 Kinderkamack Road, North Hackensack, N.J. 07601
Filed Mar. 13, 1969, Ser. No. 806,857
Int. Cl. F16k *5/02*
U.S. Cl. 251—309 **2 Claims**

A means for facilitating the assembly of plug valves wherein interfitting elements, adjustable relatively to one another, are provided on the plug and on a coverplate therefor to insure the correct assembly of the valve. In one embodiment, such elements comprise an arcuate groove or rescess of slightly greater length than a true



quadrant provided in a face of the cover plate, and a pin on the valve plug entering the recess. An additional positioning means consists of a dowel pin entering the cover plate and valve housing.

3,567,182
LIFT BRACKET ASSEMBLY FOR CAMPERS
Richard S. Steele, Broomfield, Colo., assignor to Colorado Leisure Products, Inc., Broomfield, Colo.
Filed Feb. 28, 1968, Ser. No. 708,938
Int. Cl. B60p *1/22*
U.S. Cl. 254—4 **5 Claims**

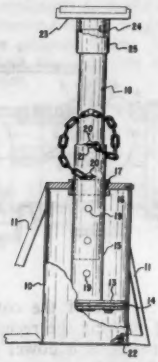


In a camper jack assembly, permanent brackets or braces are secured in load balanced relation to opposite sides of the camper in such a way as to reinforce the camper body in lifting and lowering the camper onto and from a truck bed. The permanent brackets are adapted to be engaged by conventional jacks for direct lifting, or to work in cooperation with spaced temporary brackets forming part of a separate jack assembly in which the temporary brackets straddle the permanent brackets and the camper body is once again reinforced by the permanent brackets in lifting and lowering the camper.

3,567,183
PNEUMATIC JACK
Francis D. Voss, P.O. Box 212, Emerson, Nebr. 68733
Filed June 20, 1968, Ser. No. 738,598
Int. Cl. B66f *3/24;* **F16c** *1/26;* **F16j** *15/18*
U.S. Cl. 254—93 **2 Claims**

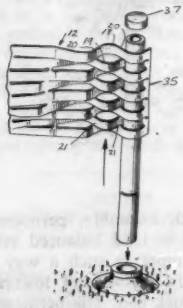
A pneumatic jack having a piston of the general shape of a central segment of a sphere. The piston rod extends through a guide which is formed with internal surfaces having an arcuate or tapered axial cross section. Adjustment of the length of the piston rod is accomplished by

a telescoping device which includes a transverse pin extending through one part of the piston rod and setting in



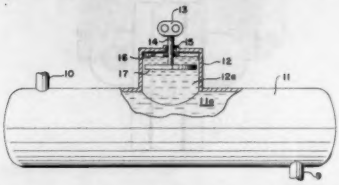
a notch in the other part, thus aligning the two parts for insertion of a second pin.

3,567,184
SAFETY FENCE
Raymond W. Yancey, 880 Oak Spring Drive, Libertyville, Ill. 60048
Division of application Ser. No. 767,303, Oct. 14, 1968, and a continuation-in-part of application Ser. No. 849,233, July 18, 1969, which is a continuation of Ser. No. 767,286, Oct. 14, 1968. This application Sept. 19, 1969, Ser. No. 859,255
Int. Cl. E01f *15/00*
U.S. Cl. 256—13.1 **12 Claims**



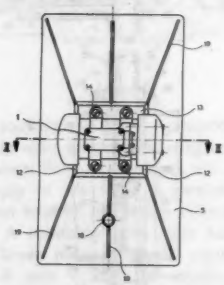
An easily erectable fence having impact absorbing energy dissipating characteristics which make the fence particularly useful as a roadway barrier. The fence includes a sheet of fencing material which is formed from an initial sheet having a plurality of transverse rows of longitudinally aligned openings defining longitudinally extending ribbons therebetween with the initial sheet being reduced in size by deforming the ribbons to provide alternating longitudinally spaced crests and troughs that are interconnected by webs having a multiplanar torsional deformation. The crests on the ribbons are aligned with troughs on adjacent ribbons to define passages in the fencing material that are perpendicular to the ribbons, so that the fence can be erected by merely sliding the fencing material over vertically disposed fence posts. The fence may be constructed of a suitable metallic material or of a suitable thermoplastic or thermosetting resinous material.

3,567,185
FLUID RESONATOR SYSTEM
Fredrick W. Ross, Del Mar, Howard E. McKinney, La Jolla, and Ivan S. Bjorklund, San Francisco, Calif., assignors to Shell Oil Company, New York, N.Y.
Filed Oct. 3, 1968, Ser. No. 764,797
Int. Cl. B01f *11/02*
U.S. Cl. 259—1 **8 Claims**



A sonic treatment vessel for liquids is arranged so that a body of liquid confined therein is functionally divided so that one portion of the body of liquid serves as a mass and the remainder serves as a spring in a resonant vibratory system so that resonant frequency vibrations generated therein distributes pressure energy substantially equal throughout the liquid.

3,567,186
APPARATUS FOR COMPACTING CONCRETE MIXTURES BY VIBRATIONS IN FORMS
Heinz Niepelt, Karlsruhe-Waldstadt, Germany, assignor to Maschinenfabrik Ettlingen Friedrich Pfeiffer K.G., Ettlingen, Baden, Germany
Filed Dec. 24, 1968, Ser. No. 786,677
Int. Cl. B01f *11/00*
U.S. Cl. 259—1 **11 Claims**

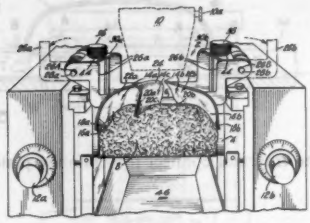


A vibrating apparatus which is adapted to be rigidly but removably attached to a concrete form for compacting a concrete mixture therein, especially for producing large concrete pipes, comprising a vibrator, a rigid supporting bracket secured to the vibrator and adapted to be applied directly upon the concrete form to transmit the vibrations thereto, and a vacuum hood secured to the supporting bracket and forming an enlargement thereof in lateral directions. When this hood is evacuated after being applied upon a surface of the concrete form, it will hold the supporting bracket together with the vibrator in a fixed position on the concrete form.

3,567,187
ROLL MILL SCRAPER BLADES
Michael P. Antalek, Fishkill, and Raymond J. Tetrault, Wappingers Falls, N.Y., assignors to Texaco Inc., New York, N.Y.
Filed Dec. 20, 1968, Ser. No. 785,581
Int. Cl. B01f *15/00*
U.S. Cl. 259—2 **22 Claims**

In cooperation with a roll mill having a spaced apart feed roll and a kneading roll forming nip rolls for blend-

ing two or more ingredients into a homogeneous mixture, a pair of cooperating scraper blades which continuously remove the ingredients after passing thru the space be-



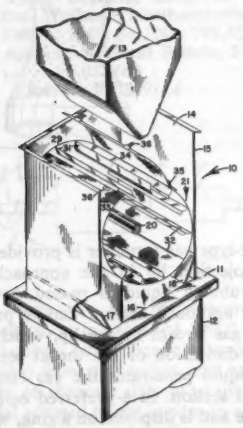
tween the nip rolls, from the surface of the feed roll and return a newly exposed surface of the ingredients to the center of the feed roll.

3,567,188

APPARATUS FOR CHARGING A SOLID PROPELLANT MIX WITH METALLIC FIBERS

Marvin H. Cooper, James C. Miller, and Walter E. Buckner, Huntsville, Ala., assignors to Thiokol Chemical Corporation, Bristol, Pa.

Filed Jan. 9, 1964, Ser. No. 336,837
Int. Cl. B01f *3/18*
U.S. Cl. 259—3 **1 Claim**



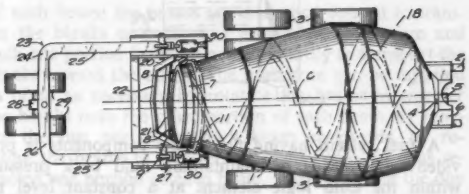
1. An apparatus for charging a solid propellant mix, comprising an open-end housing that is adapted to be positioned on the open throat of a mixer for the mix, said housing including a base plate having an opening therein conforming to the open throat of the mixer, a pair of spaced parallel diverging rectangular-shaped deflectors secured to said base plate within said housing and with the lower longitudinal edges thereof extending through the opening in said base plate, a rotary drum comprising a pair of disc-shaped end plates and a reticulated and circular wall secured at its opposite edges to the peripheral edges of said end plates, diametrically opposed bearing plates secured to the outer surface of said housing, a shaft extending through said bearing plates, said housing and said end plates centrally thereof and longitudinally of said drum for rotatably mounting said drum within said housing transversely thereof, an electric motor having a gear train secured thereto mounted on said base plate so that a flexible operational coupling between said gear train and a pulley on said shaft outwardly of one of said bearing plates will cause said drum to be rotated at a constant and even rate of speed, a plurality of equally-spaced, rectangular-shaped baffles, each baffle having the inner longitudinal portion thereof laterally inclined in relation to the main longitudinal portion with the outer longitudinal edge thereof secured to said wall, an access door hingedly mounted in said wall and fasteners mounted on said access door and said wall for retaining said access door in closed position.

3,567,189

TRUCK MIXER WITH OFFSET DRUM AXIS

William H. Buelow, Brookfield, Wis., assignor to Rex Chainbelt Inc., Milwaukee, Wis.

Filed Dec. 23, 1968, Ser. No. 786,182
Int. Cl. B28c *5/18*
U.S. Cl. 259—176 **7 Claims**



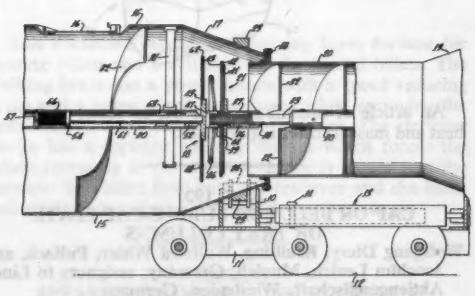
A truck mixer has a mixing drum mounted with its axis of rotation offset laterally of the centerline of the truck. The drum is offset in the direction opposite that in which the concrete ingredients are moved while being mixed and, since mixing is generally done in transit, the offset mounting has the effect of maintaining the center of gravity of the ingredients more nearly on the centerline of the truck during mixing and thereby minimizing lateral instability of the truck mixer in transit.

3,567,190

DRUM CAR AND COUPLING APPARATUS FOR CARRYING AND FEEDING CONCRETE IN TUNNELS

Ray D. Moran, 1313 N. Raymond Ave., Fullerton, Calif. 92631

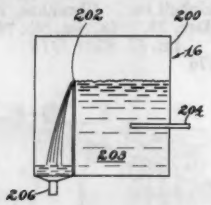
Filed Dec. 12, 1968, Ser. No. 783,183
Int. Cl. B28c *5/18*
U.S. Cl. 259—177 **17 Claims**



A plurality of agitator and feeding drums are mounted on trucks for movement along railroad tracks into tunnels or the like, each drum having a forwardly-moving gate at each end thereof. The front gate (or door) of each drum is adapted to be locked by a nut and handwheel during movement of the drum along the tracks. The back gate of each drum is adapted to be shifted forwardly in response to coupling or telescoping movement of the forward end

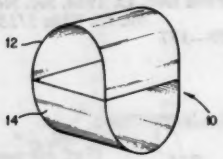
of an adjacent drum. Spring means are provided to effect automatic closing of the back gate in response to uncoupling of the agitator drums, following which the front gate of each drum may be locked by the above-indicated nut and handwheel.

3,567,191
FLUIDIC FUEL SYSTEM WITH BACK PRESSURE CONTROL
Donald F. Morgan, Horseheads, N.Y., assignor to The Bendix Corporation
Filed July 15, 1969, Ser. No. 841,840
Int. Cl. F02m *69/04*
U.S. Cl. 261—36 **11 Claims**



A fuel system having fluid logic components is provided with means of maintaining fluid back pressure within the fluid logic element at a constant level regardless of the attitude and operative situation of the fuel system. A preferred embodiment of the back pressure maintaining means comprises a narrow reservoir maintained behind a weir into which all fluid exhaust and vent passages are connected at an inlet point below the top of the weir. Fluid discharge in excess of the reservoir volume spills over the weir into a return line where it is returned to the fuel tank.

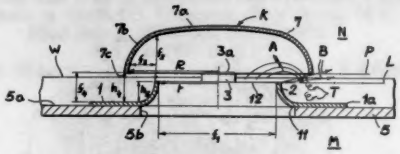
3,567,192
VESSEL PACKING ARTICLE
Frank Kerze, Jr., Bethesda, Md., assignor to the United States of America as represented by the United States Atomic Energy Commission
Filed June 13, 1968, Ser. No. 736,723
Int. Cl. B01f *3/04*
U.S. Cl. 261—94 **4 Claims**



An article of manufacture for use as vessel packing in heat and mass transfer applications.

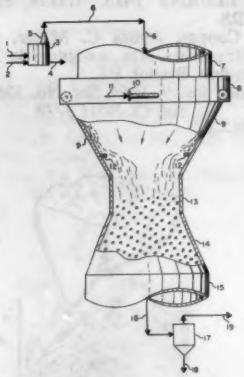
3,567,193
CAP OR BELL FOR BUBBLE-CAP PLATE OR TRAY COLUMNS
Wolfgang Diery, Krailling, Walfried Witter, Pullach, and Joachim Lenich, Munich, Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Germany
Filed Nov. 18, 1968, Ser. No. 776,444
Claims priority, application Germany, Nov. 17, 1967, P 16 19 719.6; Aug. 5, 1968, P 17 69 917.1
Int. Cl. B01f *3/04*
U.S. Cl. 261—114 **12 Claims**

A bubble-cap assembly for a tray of a rectification column, a washing column or a distillation column. The assembly consists of a chimney plate mounted upon the tray with its chimney registering with an opening in the latter and covered by a cap or bell spaced thereabove. A number of angularly spaced tongues extend at right



angle to the tray and connect the chimney plate with the bell.

3,567,194
WET APPROACH VENTURI SCRUBBER
Indravadan S. Shah, Forest Hills, and Alexander Kirschner, Brooklyn, N.Y., assignors to Chemical Construction Corporation, New York, N.Y.
Filed June 20, 1969, Ser. No. 835,157
Int. Cl. B01f *3/04*
U.S. Cl. 261—118 **19 Claims**

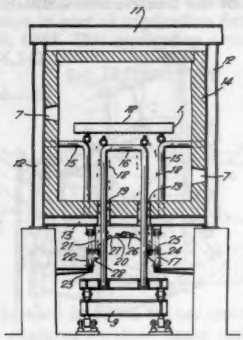


A venturi-type gas scrubber is provided which features a liquid projection lip in the approach section of the venturi. Scrubbing liquid is passed downwards on the wall of the approach section and is projected into the accelerated gas stream by the lip, which terminates outside of the dimension of the throat section, so that the scrubbing liquid penetrates the gas stream through the entire throat section. In a preferred embodiment, the lip is removable and is disposed on a ring, with an additional frusto-conical baffle depending downwards from the lower surface of the lip adjacent to the ring and terminating inside the inner dimension of the lip. A central conical baffle may be provided, to define an annular venturi scrubbing passage.

3,567,195
WALKING BEAM CONTINUOUS HEATING FURNACE
Keiji Kakuta, Yoshio Kawashima and Sukeharu Endo, Yokohama-shi, and Yukinaga Katahashi, Machida-shi, Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo-to, Japan
Filed Apr. 24, 1968, Ser. No. 723,836
Claims priority, application Japan, June 26, 1967, 42/40,549; Dec. 12, 1967, 42/104,328
Int. Cl. F27d *3/12*
U.S. Cl. 263—6 **4 Claims**

A continuous heating furnace of walking beam type wherein a suitable number of walking beams of Rahmen structure are arranged in parallel in the direction of the

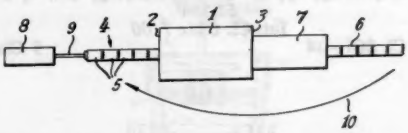
movement of the object to be heated along with a suitable number of fixed beams of Rahmen structure, both of said type of beams being constructed by fixing a required number of hair-pin beams to a plurality of longitudinally placed beams and wherein cooling water in both of said types of beams is made to flow in one direction only.



3,567,196
HIGH TEMPERATURE FURNACE AND CONVEYOR THEREFOR

Frederick James Edwards, Hebron, Morpeth, Northumberland, and Norman Hughes, Ponteland, New Castle upon Tyne, England, assignors to Thermal Syndicate Limited, Wallsend, Northumberland, England

Filed Feb. 6, 1969, Ser. No. 799,552
Claims priority, application Great Britain, Feb. 6, 1968, 5,878/68
Int. Cl. F27b *9/14*
U.S. Cl. 263—6 **12 Claims**



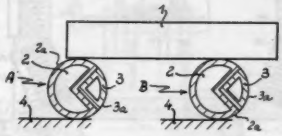
The invention relates to a high temperature furnace in particular for application in excess of 1000° C. comprising a heating chamber, guide means extending through the heating chamber from a chamber inlet to a chamber outlet, a plurality of separate slats of graphite or other refractory material adapted to rest in edge-to-edge abutting relationship on the guide means to define a supporting surface for an article or articles to be conveyed through the heating chamber, advancing means upstream of the chamber inlet for intermittently advancing an abutting array of such separate slats over the guide means and through the heating chamber, and means downstream of the chamber outlet for removing slats and returning them to a position intermediate the advancing means and the chamber inlet.

3,567,197
METALLURGICAL FURNACE AND METHOD OF TRANSPORTING COMMODITIES THEREIN

Rüdiger Knaak, Neuss, Germany, assignor to Koppers-Wistra-Ofenbau Gesellschaft mit beschrankter Haftung, Dusseldorf, Germany

Filed Apr. 8, 1969, Ser. No. 814,415
Claims priority, application Germany, Apr. 9, 1968, P 17 58 139.4
Int. Cl. F27b *9/14*
U.S. Cl. 263—6 **23 Claims**

A metallurgical furnace wherein a support carries several parallel beams which extend between the inlet and the outlet of the heating chamber. Each beam comprises two longitudinally extending portions each of which extends the full length of the respective beam and both of which are movable angularly with reference to the support. One portion of each beam is also movable forwardly (toward the outlet) and backwards (toward the inlet) relative to the other portion of the respective beam. Ingots, slabs, billets or like metallic blanks are placed onto the beams while the beams assume such angular positions that the blanks come to rest on the other portion

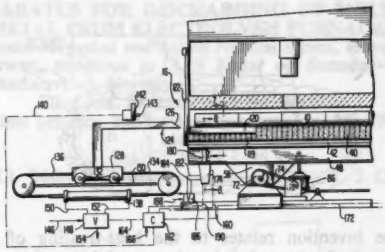


of each beam; the beams are thereupon rotated to transfer the blanks onto the one portion of each beam and such one portion is then moved forwardly to transport the blanks toward the outlet. The procedure can be repeated as often as necessary by rotating the beams to transfer the blanks onto the other portion of each beam, by moving the one portion of each beam backwards, by rotating the beams to transfer the blanks onto the thus retracted one portion of each beam, and by moving the one portion of each beam forwardly.

3,567,198
RETRIEVER MEANS FOR WALKING BEAM FURNACE

Charles B. Gentry, Grand Rapids, Mich., assignor to Granco Equipment, Inc., Grand Rapids, Mich.

Filed Nov. 14, 1969, Ser. No. 876,860
Int. Cl. B65g *25/04;* **F27b** *9/14*
U.S. Cl. 263—6 **17 Claims**



This disclosure relates to a walking beam furnace for heating billets and a retriever for the heated billets. The walking beam has a power means with a speed reducing drive and a lower speed is employed while removing the heated billets from the end of the furnace. The retriever device has a forward wedging surface which forces the billets upwardly as the retriever device is moved into the furnace. The billet falls onto the retriever and the billet and retriever are then withdrawn from the furnace.

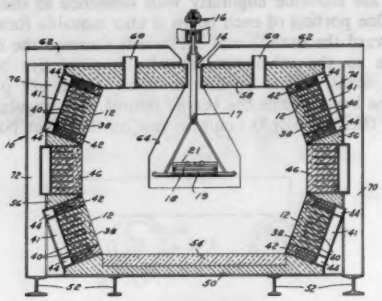
3,567,199
APPARATUS FOR BRAZING ALUMINUM RADIATORS

Artemas F. Holden, 2195 S. Milford Road, Milford, Mich. 48042

Original application Nov. 9, 1966, Ser. No. 593,091, now Patent No. 3,456,331. Divided and this application Feb. 3, 1969, Ser. No. 823,210
Int. Cl. F27b *9/14*
U.S. Cl. 263—6 **10 Claims**

A radiant heat furnace for brazing aluminum parts having complex shapes and components of different gage

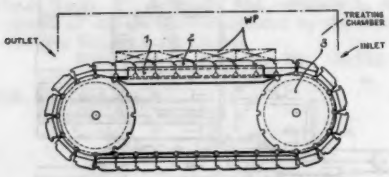
material such as automobile radiators and utilizing directed heating panels and directed cooling air flows to obtain proper heat absorbtion and transfer rates in the components thereby obtaining proper brazing temperatures throughout the assembly being brazed.



3,567,200
HEAT-TREATING OF WORKPIECES

Rüdiger Knaak, 17 Heinestrasse, 4040 Neuss, Germany; Hans Christoph Pohl, 29 Mittelstrasse, 4041 Norf, Germany; Günter Hepp, 159 Dieckerstrasse, 4200 Oberhausen, Germany; Christian Brockmann, 2 Franziskanerstrasse, 4300 Essen, Germany; Wilhelm Schwietering, 84 Karl Meyer Strasse, 4650 Gelsenkirchen, Germany; and Hans Jakubzik, 42 Burgstrasse, 4680 Wanne-Eickel, Germany

Filed Mar. 6, 1969, Ser. No. 804,896
Int. Cl. F27b *9/24*
U.S. Cl. 263—8 **30 Claims**



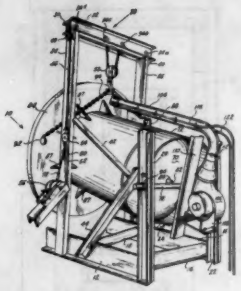
The invention relates to the heat-treating of workpieces. A furnace chamber has an inlet and an outlet and includes a lower zone and an upper heat-treating zone. Elongated tubular guide means extends from the inlet to the outlet in the lower zone and its upper wall portion which faces the upper zone is provided with a longitudinally extending slot. Carriers are located and guided for movement within the tubular guide means in an upright position and provided with workpiece-supporting portions which extend through the slot into the heat-treating zone to support a workpiece. Return guide means is provided for guiding the carriers for return movement from the outlet to the inlet of the chamber.

3,567,201
FURNACE FOR MELTING SCRAP METAL

William R. Beckett, 409 5th Ave. NE., Clarion, Iowa 50525

Filed Oct. 23, 1968, Ser. No. 769,853
Int. Cl. C21b *11/00*
U.S. Cl. 266—33 **8 Claims**

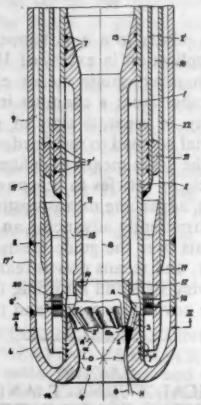
A furnace for melting scrap metal which includes a steel barrel lined with a high refractory substance to form a crucible that is directly fired. This furnace is movably mounted relative to a supporting frame wherein the furnace is susceptible of being tilted with the melted material therein so that said material can be poured in its melted state directly out of the crucible into a suitable receptacle or mold. A dampered blower system used with this furnace is utilized to keep the fuel cool until it enters the heating assembly. This furnace is portable intact for use in different locations if desired.



3,567,202
DEVICE FOR INJECTION BY TOP-BLOWING INTO A METAL BATH

Robert Mercatoris, Luxembourg, Luxembourg, and Joseph Nepper, Saarbrucken, Germany, assignors to Acieries Reunies de Burbach-Eich-Dudelange S.A., Luxembourg, Luxembourg

Filed Oct. 2, 1967, Ser. No. 672,107
Claims priority, application Luxembourg, Oct. 4, 1966, 52,104
Int. Cl. C21c *7/00*
U.S. Cl. 266—34 **9 Claims**

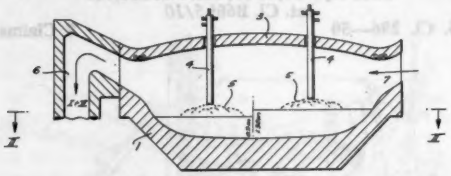


In refining a ferrous melt in a metallurgical furnace, a primary stream of oxidizing fluid is trained upon the bath surface from a lance which also has means for emitting a secondary stream of oxidizing fluid, the latter enveloping the primary stream and swirling around it, with or without injection of solid particles entrained by the primary stream.

3,567,203
METHOD AND APPARATUS FOR PRODUCING STEEL

Walter Hess, Essen, Germany, assignor to Rheinische Stahlwerke, Essen, Germany

Continuation-in-part of application Ser. No. 478,618, Aug. 10, 1965. This application Aug. 13, 1968, Ser. No. 756,342
Int. Cl. C21c 7/00
U.S. Cl. 266—34 9 Claims

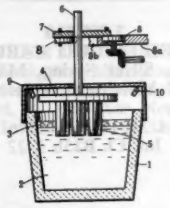


A hearth furnace in which burner means extending into the furnace chamber produce flame cones by burning a mixture of fuel and oxygen for melting and refining steel-forming material located in a hearth portion of the furnace chamber, and in which heated air passed from regenerative chambers into the furnace chamber is guided about the flame cones and onto the material melting in the hearth portion.

3,567,204
APPARATUS FOR REFINING MOLTEN METAL

Ryo Ando and Tsutomu Fukushima, Yokohama-shi, Eiichi Hiraguchi, Toyoda-gun, and Kokichi Hagiwara, Yokohama-shi, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Original application July 25, 1967, Ser. No. 655,921. Divided and this application May 5, 1969, Ser. No. 821,877
Int. Cl. C21c 7/00
U.S. Cl. 266—34 3 Claims



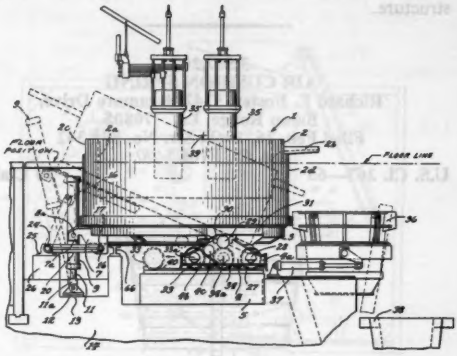
An apparatus for refining a molten metal such as molten pig iron. The molten metal which contains impurities is poured into a vessel such as a suitable ladle. A purifying agent which reacts with the molten metal to eliminate at least part of the impurities thereof is added to the molten metal. Then the molten metal to which the purifying agent has been added is stirred only in the region of the surface of the molten metal. The adding of the purifying agent to the molten metal and the stirring thereof takes place after the molten metal has been poured into the vessel during a period of time when parts of the body of molten metal within the vessel are still in motion. In the case of pig iron this period of time has a duration of at least one hour.

The apparatus includes the vessel into which the molten metal is poured up to a given elevation in the vessel, and a stirring means which is situated over the vessel and extends into the molten metal therein, this stirring means including at least one stirrer which extends downwardly into the vessel through the surface of the molten metal to an elevation which is only slightly less than the above given elevation where the surface of the metal is located. The extent to which the stirrer extends to an elevation lower than this latter given elevation is less than one third of the latter given elevation.

3,567,205
TILTING MECHANISM FOR MOLTEN METAL RECEPTACLE

Frank K. Armour, Flossmoor, and Arthur J. Benke, Willow Springs, Ill., assignors to Interlake Steel Corporation, Chicago, Ill.

Filed May 22, 1968, Ser. No. 731,088
Int. Cl. C21c 5/50
U.S. Cl. 266—36 8 Claims

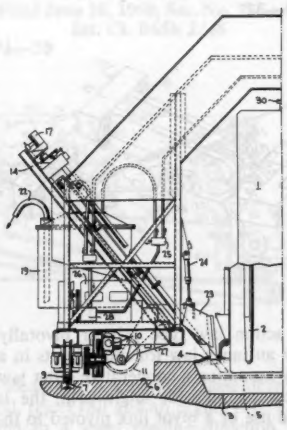


A receptacle for containing molten metal having use as a furnace for heating the metal. The receptacle has improved mechanism for tilting the receptacle for pouring to discharge the molten metal from it. The tilting mechanism combines a rolling carriage supporting the receptacle at one end and a power cylinder supporting it at the other end. Actuation of the power cylinder combines rolling movement of the carriage with tilting of the receptacle.

3,567,206
APPARATUS FOR DISCHARGING OF MOLTEN METAL FROM ELECTROLYSIS FURNACES

Gudmund Heggstad and Johan Nikolai Ström, Hoyanger, Norway, assignors to A/S Ardal og Sunndal Verk, Sorkedalaveien, Norway

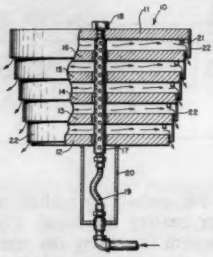
Filed Jan. 24, 1968, Ser. No. 700,258
Claims priority, application Norway, Jan. 24, 1967, 166,543
Int. Cl. F27d 3/06
U.S. Cl. 266—38 2 Claims



An apparatus for discharging of molten metal from electrolysis furnaces wherein the discharging is effected by

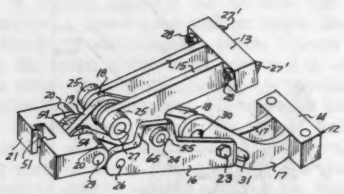
sucking the metal from the furnace bath into a crucible, comprising, a gantry structure having a pair of interconnected legs which span a row of the furnaces and are adapted to run along either side thereof and transversely beyond the ends thereof, at least one of the gantry legs is provided with an oblique guide structure extending outwardly and inwardly relative to the other leg, such guide structure being provided with crucible supporting means adapted to move the crucible along the length of the guide structure.

3,567,207
AIR CUSHION SPRING
Richard E. Foster, 5342 Sycamore Drive, Baton Rouge, La. 70805
Filed Feb. 26, 1969, Ser. No. 802,342
Int. Cl. F16f *5/00*
U.S. Cl. 267—65 **10 Claims**



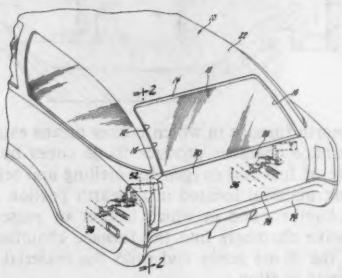
Shock absorbing support systems for vehicles are described. The systems involve, inter alia, a group of horizontal plates between which a film or volume of air is maintained. The system enables the passenger to literally ride on air without loss of vehicular traction and control.

3,567,208
TOGGLE ACTION JAW TYPE GRIPPER
Leland F. Blatt, Grosse Pointe, Mich. (24121 Mound Road, Warren, Mich. 48091)
Filed June 6, 1969, Ser. No. 831,122
Int. Cl. B23q *3/08*
U.S. Cl. 269—32 **8 Claims**



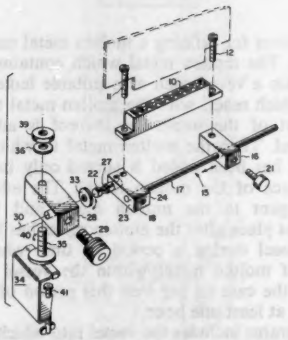
A toggle action jaw type gripper pivotally mounting upon a body an inner jaw for movements in a first path, and pivotally mounting a cooperative outer jaw for movement in a compound wide angle path, the latter determined by the use of a pivot link pivoted to the body and to the inner jaw arms, and upon which the outer jaw is pivotally mounted, together with a pair of arm plates pivoted to the body and having a pin and slot flexible connection with said outer jaw. The inner jaw and the arm plates are simultaneously actuated by reciprocating a clevis guidably in the body which is linked to said inner jaw and to said arm plates.

3,567,209
VEHICLE BODY
Michael W. Lathers, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Apr. 16, 1969, Ser. No. 816,719
Int. Cl. B60j *5/10*
U.S. Cl. 296—50 **7 Claims**



A station wagon includes a tailgate window for opening and closing the upper portion of the rear opening and a tailgate for opening and closing the lower portion of the opening. The tailgate is supported by arms extending inwardly of the body and pivoted to the chassis rails for movement about a horizontal axis transverse of the body. When the tailgate moves to open position, it moves between the load floor and the bumper structure. A counterbalance arrangement supports the tailgate in its open position.

3,567,210
PREFORMED CIRCUIT CARD HOLDER
Manuel Chevillon, Silver Spring, Md., assignor to the United States of America as represented by the Secretary of the Army
Filed Oct. 31, 1968, Ser. No. 772,329
Int. Cl. B25b *1/22*
U.S. Cl. 269—73 **5 Claims**

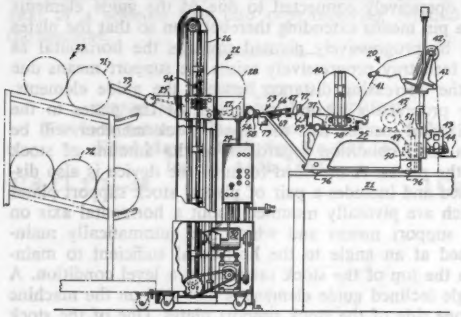


A work-holding apparatus for holding preformed circuit cards while they are being worked upon. Multidirectional movement of the work-holding portion of the apparatus permits adjustment of the position of the work piece. Adjustable jaws permit preformed circuit card connectors of various sizes to be removably mounted thereon in order to retain preformed circuit cards of various size.

3,567,211
CLOTH ROLL CARRIER AND LOADING ACTUATOR

Thomas W. Martin, Sr., Nashville, Tenn., assignor to Cutters Machine Company, Inc., Nashville, Tenn.

Filed June 10, 1969, Ser. No. 831,872
Int. Cl. B65h *29/46*
U.S. Cl. 270—31 9 Claims

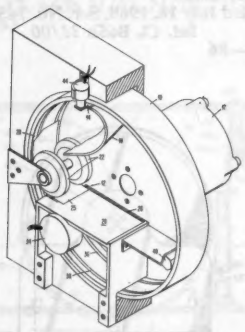


A roll loading actuator including a cloth roll loading unit having means for discharging a roll from the unit upon actuation of a signal, a roll carrier moveable toward and away from the loading unit having an actuator adapted to actuate the signal means for discharging a load from the loading unit upon the roll carrier, and means for deenergizing the signal actuator as long as a cloth roll is in position on the roll carrier.

3,567,212
REVOLVING DRUM DOCUMENT TRANSPORT

Albert L. Hiatt, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 24, 1969, Ser. No. 860,529
Int. Cl. B65h *29/58*
U.S. Cl. 271—51 8 Claims

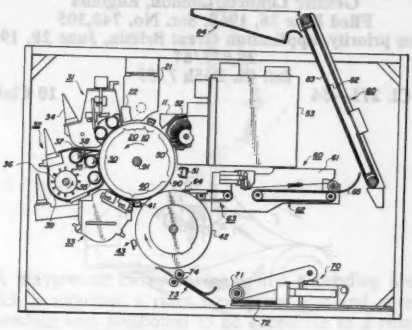


A rotary drum document transport comprising a hollow cylindrical rotating drum, a document cornering station, and a document diverter. The document is cornered and inserted on the interior of the drum and carried thereon by centrifugal force. The document diverter strips the document from the drum interior and directs it to a receiver for stacking.

3,567,213
CONTROL APPARATUS FOR REGISTER STOPS AND GRIPPER FINGERS

Paul R. Lagonegro, Henrietta, and Paul D. Keller, Rochester, N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed June 4, 1969, Ser. No. 830,236
Int. Cl. B65h *5/14, 29/06*
U.S. Cl. 271—3 4 Claims

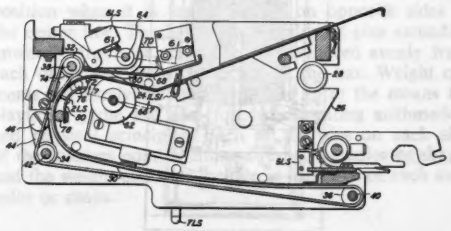


An apparatus for selectively controlling the operation of register stops and gripper fingers on a transfer drum in a reproduction apparatus having a non-rotating cam and a rotatable follower which are located external to the transfer drum. The cam is selectively movable between an inoperative position which is remote from the transfer drum and an operative position which is immediately adjacent the transfer drum. The follower rotates with the transfer drum and operates the register stops and gripper fingers on the drum in response to the shape of the cam only when the cam is in its operative position. The cam is moved into its operative position while the transfer drum continues to rotate by a solenoid which pivots an arm against the cam and moves it into engagement with the follower.

3,567,214
SHEET FEEDING AND SEPARATING APPARATUS

Melvin G. Crandell, Walworth, and Donald L. Pease, Marion, N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed June 10, 1968, Ser. No. 735,669
Int. Cl. B65h *3/46*
U.S. Cl. 271—10 10 Claims



A sheet feeding and separating assembly including a conveyor roll, reject roll and an urging roll. The conveyor roll is driven in a sheet feeding direction while a cooperating reject roll is driven in a sheet rejecting direction through a slip clutch to ensure forwarding only single sheets. Motion of a sheet beyond these rolls inactivates the drive to the conveyor roll so that the reject roll will

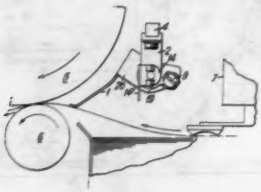
counter-rotate the conveyor roll after the passage of the fed sheet. The introduction of the next sheet into the nip is effected through an urging roll which moves into and out of driving contact with the topmost sheet of the stack under the influence of the rotation of the conveyor roll.

3,567,215

SHEET HANDLING APPARATUS

Albert G. R. Gates, London, England, assignor to Gestner Limited, London, England

Filed June 26, 1968, Ser. No. 740,305
Claims priority, application Great Britain, June 28, 1967, 29,957/67
Int. Cl. B65h 7/02
U.S. Cl. 271—56 10 Claims



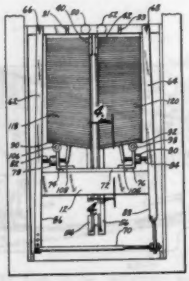
This invention provides a device for preventing the creasing of sheets in sheet handling apparatus. The device includes a surface which is positioned in the path of sheets through the apparatus and which thereby causes each sheet to undergo bowing deformation about an axis transverse to its direction of travel, thereby preventing creasing in a direction substantially parallel to the direction of travel. The surface may be deflected by contact with one or more strong sheets but is biased towards its operative position. In one embodiment either one or two different values of biasing force may be employed.

3,567,216

AUTOMATIC LEVELLING DEVICE FOR A FEEDING UNIT ON AN OFFSET PRINTING MACHINE OR THE LIKE

Richard F. Zeller, 2741 51st St., Des Moines, Iowa 50310

Filed Dec. 13, 1968, Ser. No. 783,499
Int. Cl. B65h 1/08
U.S. Cl. 271—62 4 Claims



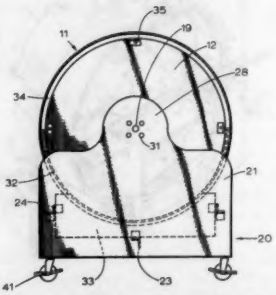
An automatic stock levelling device for the feeding unit on an offset printing machine or the like including a vertically disposed frame means adapted to be detachably secured to the machine at the feed end thereof. A support means is vertically movably mounted in the frame means and is progressively raised during the printing operation by the machine feed tray. A pair of pivotal stock support plates are pivotally mounted about a horizontal axis on the support means and are automatically maintained at an angle to the horizontal sufficient to maintain the top of the stock material in a level condition. A pair of substantially vertically disposed spaced apart guide elements are pivotally secured at their upper ends to the frame means and are positioned at opposite sides of the support plates. The distance between the upper ends of the guide elements is less than the distance between the lower ends thereof. Each of the support plates are operatively connected to one of the guide elements by a pin means extending therebetween so that the plates will be progressively pivoted towards the horizontal as the feed tray progressively raises the support means due to the decreasing distance between the guide elements. The progressive pivotal movement of the plates to the horizontal insures that the upper stock member will be in a level condition regardless of the amount of stock on the plates. A modified form of the device is also disclosed and includes a pair of pivotal stock support plates which are pivotally mounted about a horizontal axis on the support means and which are automatically maintained at an angle to the horizontal sufficient to maintain the top of the stock material in a level condition. A single inclined guide element is mounted on the machine at one side of the stock support plates. One of the stock support plates has a cam follower mechanism movably mounted thereon which engages the guide element to cause the stock support plate to be progressively pivotally moved to a horizontal condition as the machine feed tray is raised during the printing operation. A linkage means interconnects the stock support plates to co-ordinate the pivotal movement thereof. Means is also provided to provide the proper tension on the stock material and consists of a substantially inverted cone-shaped member which is vertically movable and rotatably mounted adjacent one side of the stock positioned on the stock support plates.

3,567,217

METHOD AND APPARATUS FOR COLLATING SHEET COPIES FROM A DUPLICATING DEVICE

Penelope J. Fink, Lemon Grove, and James R. Warren, Chula Vista, Calif., assignors to Rohr Corporation, Chula Vista, Calif.

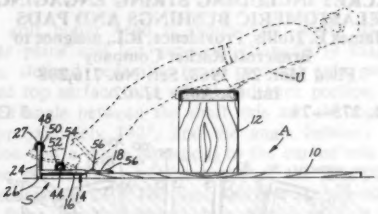
Filed July 18, 1968, Ser. No. 745,734
Int. Cl. B65h 31/00
U.S. Cl. 271—86 2 Claims



A method and apparatus for manually collating sheet copies from a reproduction machine is disclosed. The apparatus comprises a rotatable drum having a multiplicity of copy-receiving bins about its circumference. The drum is rotatably mounted on a platform and so sized

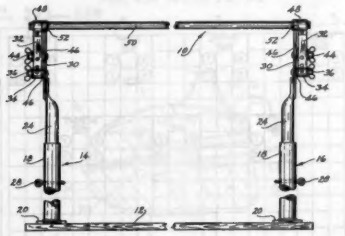
that desired ones of the bins therein can be aligned with the output station of a duplicating device by manual rotation of the drum. Spring-biased detent means are provided to yieldably secure the drum in any one of its discrete angular positions. The disclosed method includes the steps of manually moving a selected one of a plurality of copy receiving bins along a circular path into copy-receiving relation to a reproduction machine discharge station, operating the machine to eject a predetermined number of copies into the selected bin, and terminating the production of copying while manually rotating the next of a selected bins into copy-receiving relation to the machine.

3,567,218
BENDING EXERCISING DEVICE
Edwin S. Johnson, Rte. 2, Benson, Minn. 56215
Filed May 29, 1968, Ser. No. 733,167
Int. Cl. A63b *23/02*
U.S. Cl. 272—58 **1 Claim**



The disclosure includes a base, a seat carried by the base, an outer roller carried by said base outwardly thereof together with an inner roller carried by the base inwardly of said outer roller and lower than the same relative to the base.

3,567,219
UNIVERSAL PHYSICAL EXERCISING DEVICE
Timothy G. Foster, R.R. 2, Maquon, Ill. 61458
Filed May 16, 1969, Ser. No. 825,312
Int. Cl. A63b *21/02, 21/10, 21/32*
U.S. Cl. 272—83 **5 Claims**

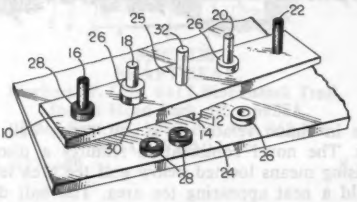


A physical exercising device that enables a person to perform a variety of body exercises. Laterally-spaced parallel bars, supported upon flexible cantilever arms, are engaged by the person while performing the exercises. Means are provided to adjust the space between the bars by pivoting the arms and securing them in position, and means are also provided to regulate the degree of flexibility of the arms so as to adjust the resistance offered to the person employing the device.

3,567,220
PLAYGROUND SWING ACTUATOR
James W. Cox, P.O. Box 193,
Upper Lake, Calif. 95485
Original application June 29, 1964, Ser. No. 378,746, now abandoned. Divided and this application Nov. 30, 1967, Ser. No. 704,964
Int. Cl. A63g *9/16*
U.S. Cl. 272—89 **4 Claims**

A playground swing having a first depending arm on which is mounted a rider supporting seat and a second depending arm positioned to be accessible to a rider occupying the seat. A mechanical linkage between the two arms, which mechanical linkage affords a motion amplification or reduction between the two arms so that the rider can control his swinging movement by application of force on the second depending arm.

3,567,221
BALANCING GAME AND TEACHING AID
William Emerson Stults, Fort Wayne, Ind., assignor to Sargent-Welch Scientific Company, Skokie, Ill.
Filed May 2, 1968, Ser. No. 726,151
Int. Cl. A63f *9/00;* **G09b** *19/02*
U.S. Cl. 273—1 **12 Claims**

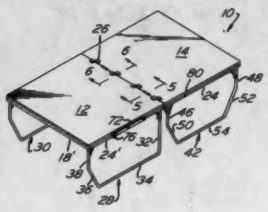


The invention concerns a balance bar having a fulcrum on the bottom which will support the bar in a horizontal position when it is loaded evenly on opposite sides of the center line. The bar has a plurality of pins extending upwardly from the top surface and spaced evenly from each other and from the center of the bar. Weight elements are receivable on the pins to form the means for playing a game and also for demonstrating arithmetical and physical principles. Each of the pins on each side of the fulcrum point is either a respective color or shape, and the weight elements include at least one of each such color or shape.

3,567,222
COLLAPSIBLE TABLE TENNIS TABLE
Jerome Robins, Philadelphia, Pa., assignor to Wallace Products, Inc., Philadelphia, Pa.
Filed May 27, 1968, Ser. No. 732,444
Int. Cl. A63b *61/00*
U.S. Cl. 273—30 **5 Claims**

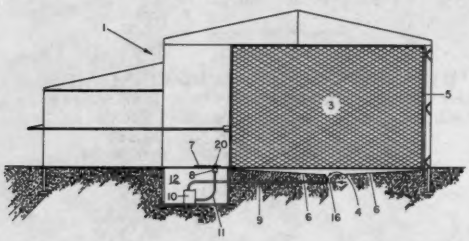
A collapsible table tennis table is disclosed having pivotable table halves. One table half may be positioned

so that it acts as a backboard when playing solo. Reinforcement brackets are provided between the table top and its frame so as to absorb the weight of the upright table half used as a backboard. When collapsed, it may



be wheeled to any desired location for storage. The table halves are constructed by connecting the table top to its frame by use of glue and/or screws. The table top frames are preferably rectangular aluminum extrusions.

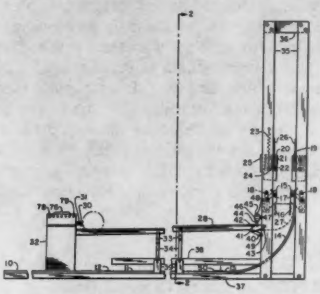
3,567,223
GOLF RANGE BALL HANDLING MEANS
Joseph A. Gentiluomo, 1456 Belmont Ave., Schenectady, N.Y. 12308
Filed Jan. 20, 1967, Ser. No. 610,557
Int. Cl. A63b *69/36*
U.S. Cl. 273—35 **7 Claims**



This invention relates to a golf range ball handling means. The novel combination features a discrete ball dispensing means located below golf tee area level so as to yield a neat appearing tee area. The ball dispensing means located in the basement area provides accessibiltiy to said means and allows for balls to be checked and replaced, when necessary, without interrupting range play. The invention in entirety consists of an inclined floor, a ball retreiving gutter, a ball return means to return balls to said ball dispensing means, and a ball elevating means to elevate balls from said ball dispensing means to the ball teeing means for golfers usage.

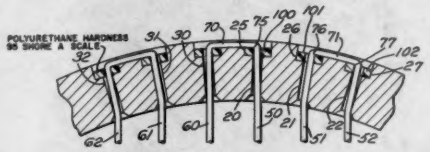
3,567,224
BOWLING PRACTICE GAME APPARATUS
Robert L. Forgacs, 1618 N. Evangeline, Dearborn Heights, Mich. 48127
Filed Mar. 29, 1968, Ser. No. 717,155
Int. Cl. A63d *5/00, 5/02*
U.S. Cl. 273—41 **8 Claims**

A bowling practice game apparatus having a transversely movable plurality of ball sensors on a substandard length alley spaced substantially the same distance from the foul line as the marker spots on a standard alley. Indicator lights are illuminated in response to actuation of the sensors to provide a hypothetical pinfall indication approximating actual pinfall for both first and second balls. A mechanism is provided which prevents reverse rolling balls from actuating the sensors. A curved ramp, an optional one way gate and



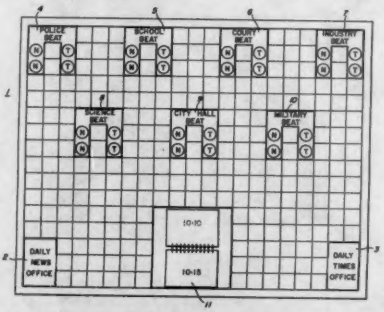
an energy absorber at the end of the alley cooperate to return the ball to the bowler.

3,567,225
RACKET INCLUDING STRING ENGAGING ELASTOMERIC BUSHINGS AND PADS
James E. Hollis, Providence, R.I., assignor to Brancroft Racket Company
Filed Mar. 26, 1968, Ser. No. 716,208
Int. Cl. A63b *51/02*
U.S. Cl. 273—73 **3 Claims**



A strung game racket in which the primary strings are borne on the surfaces which are resiliently-cushioned by elastomeric bushings and pads to amplify string recovery power under heavy strain as well as to prevent string abrasion at points of concentrated surface loading.

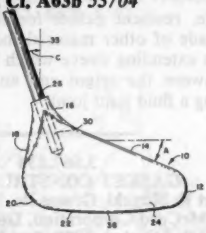
3,567,226
APPARATUS FOR PLAYING A GAME SIMULATING NEWSPAPER REPORTING AND PUBLISHING
Gilbert T. Matthews, 2943–B N. Flanwill Blvd., Tucson, Ariz. 85716
Filed Dec. 13, 1968, Ser. No. 783,492
Int. Cl. A63f *3/02*
U.S. Cl. 273—134 **1 Claim**



A game is disclosed which simulates the competition and fortuity encountered in the day-to-day gathering and dissemination of news by newspaper organizations. A primary board includes a plurality of newspaper offices and a plurality of "beats" set forth on a grid as well as a "timer" comprising a pad with a specific time printed on each page such that increments of game time pass as each page is turned. An auxiliary board is utilized to keep track

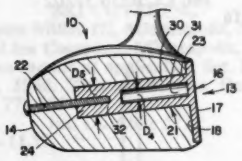
of the stories gathered by two or four players. A specially marked die, a deck of story cards, a deck of scoop cards, and a number of indicator pieces and discs are utilized in playing the game according to prescribed rules.

3,567,227
GOLF PUTTER WITH TWO TRIANGULARLY SHAPED HITTING FACES
Allen T. Panks, 106 E. 12th Ave., Sault Ste. Marie, Mich. 49783
Filed Aug. 13, 1968, Ser. No. 752,246
Int. Cl. A63b *53/04*
U.S. Cl. 273—168 **10 Claims**



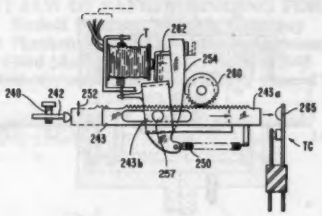
A golf putter head is symmetrical about its vertical center plane and has generally triangularly shaped side faces, defined generally by a rounded sole portion, a sloped top surface, and a heel and back portion. The included angle between the shaft axis and the top portion is approximately 132°, and the angle between the top portion and a plane tangential to the curved sole portion in the general area of the center of the sole portion is approximately 22°. The heel and toe are rounded. The side faces are flat and slightly sloped to give a slight lofting tendency to the ball. The location of the shaft and the shape of the head are such as to give good results if the ball is hit on almost any area of the hitting face, thus minimizing the importance of striking the ball accurately with the "sweet spot" of the club. The design of the head gives a better perspective to the user when looking down from the putting position, facilitates use by different persons at different angles and distances, eliminates or minimizes the importance of a sweet spot, and tends to eliminate bounce in the ball when hit.

3,567,228
HIGH ENERGY GOLF CLUB
John Nord Lynn, 4624 Gable Drive, Encino, Calif. 91316
Filed Oct. 9, 1968, Ser. No. 766,059
Int. Cl. A63b *53/08*
U.S. Cl. 273—169 **1 Claim**



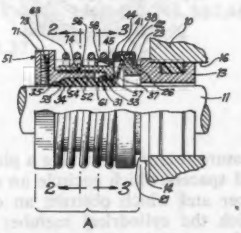
A golf club head has a face plate incorporated in its striking face. Rigidly secured to the face plate is a rod that extends towards the club rearward wall. The plate and rod are constructed from metal characterized by a high modulus of elasticity so that upon impact with a golf ball less deformation is experienced by the club head. As a consequence, energy that other would be absorbed by the club head and thereby wasted becomes available for transmission to the golf ball in order to stroke it through longer distances.

3,567,229
TRANSCRIBING APPARATUS WITH VARIABLE AUTOMATIC RECALL FACILITIES
Charles L. Ridings, Bruno F. Wehmer, and Walter F. Wing, Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jan. 19, 1968, Ser. No. 699,253
Int. Cl. G11b *5/00*
U.S. Cl. 274—1 **9 Claims**



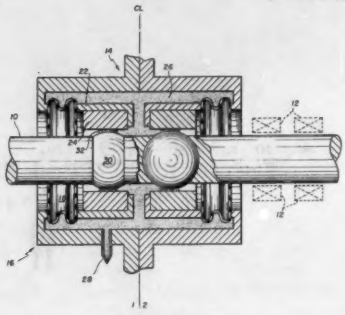
The invention concerns dictating transcribing apparatus using a magnetic belt record media and having a variety of automatic and semiautomatic features. The transcribing unit has an associated head set and foot control and is arranged for loading and unloading of the magnetic belt from the front of the unit. Various operating controls are also provided on the front of the transcribing unit. Transcribing operations are under control of a foot pedal and include starting and stopping of the belt movement, a measured review which is repeatable, a forward review, and other operations required for transcribing. The unit features automatic recall structures and circuits for relatively repositioning the sound head and belt up to five (5) words of prior dictation following release of the foot control in a playback operation in order to repeat the words when started again. A rack and timer cooperate with relay circuits to control the extent of recall.

3,567,230
SHAFT SEAL
Norbert W. Gits, 6417 Blackhawk Trail, Indian Head Park, Ill. 60525
Filed Sept. 25, 1969, Ser. No. 861,006
Int. Cl. F16j *15/36*
U.S. Cl. 277—89 **8 Claims**



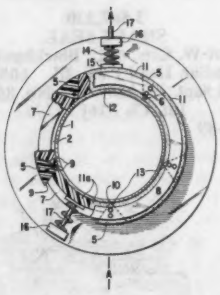
A rotatable seal for sealing a shaft with respect to an enclosure from which the shaft extends to preclude leakage from or into the enclosure along the shaft and rubbing surfaces are provided on the rotating seal and the enclosure respectively. In particular, an improved packing is provided to achieve fluid tightness of the seal with respect to the shaft, together with means to adjustably compress the packing into such tight relation by simple, effective means.

3,567,231
ROTARY SEAL ASSEMBLY
William C. Albert, Waldwick, N.J., assignor to Singer-General Precision, Inc., Little Falls, N.J.
Filed Dec. 4, 1968, Ser. No. 781,166
Int. Cl. F16j *15/40*
U.S. Cl. 277—135 **2 Claims**



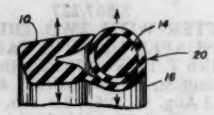
A sealing assembly for a rotating member extending in two mediums of differing pressures, including one or more bushings extending over the rotating member with a non-wetting liquid disposed in a space between the bushings and the rotating member to provide a seal between the mediums.

3,567,232
ROTARY SEAL
Ray M. Rickerson, Conroe, Tex., assignor to Cities Service Company
Filed Oct. 30, 1968, Ser. No. 771,762
Int. Cl. F16j *15/16*
U.S. Cl. 277—148 **8 Claims**



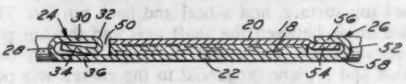
A low pressure rotary seal having a plurality of sealing segments and spacers which encircle an essentially cylindrical member and which obstruct an oversize opening through which the cylindrical member extends into a chamber enclosure. Either the cylindrical member or the enclosure may rotate. The sealing segments are radially movable with respect to the axis of the cylindrical member, have parallel end edges and an arcuate inner edge which conforms to the periphery of the member. The sealing spacers are fixedly mounted wedges which are located between the segments and have end edges which are parallel to and in slidable contact with the end edges of adjacent segments. Automatic compensation for wear is effected by continuously urging the segments into contact with the cylindrical member.

3,567,233
GASKET MEANS FOR PIPE
Fred C. Stepanich, R.R. 1, Cherryvale, Kans. 67335
Filed July 11, 1968, Ser. No. 744,040
Int. Cl. F16j *15/02*; F16l *21/02*
U.S. Cl. 277—177 **6 Claims**



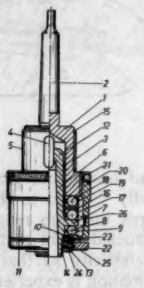
A flexible, resilient gasket for the joints of concrete or pipes made of other material includes a chevron portion and an extending sleeve which is rolled up and compressed between the spigot end and bell end of a pipe joint making a fluid tight joint.

3,567,234
GASKET CONSTRUCTION
Robert R. Skrycki, Grosse Ile, Mich., assignor to McCord Corporation, Detroit, Mich.
Filed Sept. 3, 1969, Ser. No. 854,957
Int. Cl. F02f *1/00*
U.S. Cl. 277—235 **9 Claims**



A gasket for use between the cylinder head and block of an engine having a core of compressible rubber-asbestos composition laminated between two thin metal sheets. The metal sheets are of slightly different thickness. Around the edge of the gasket openings registering with the cylinders in the block the thicker metal sheet is reversely bent upon itself to present a combustion seal flange of three metal thicknesses. Around the bolt openings in the gasket the thicker metal sheet is bent over the edge of the thinner metal sheet so that the compressed thickness thereof is slightly less than the compressed thickness of the gasket around the combustion sealing flanges for the cylinders.

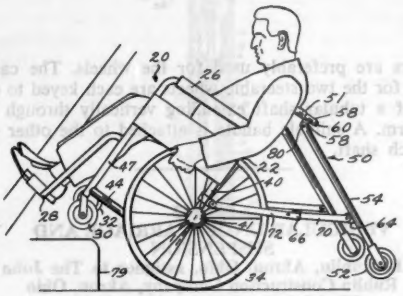
3,567,235
TOOL HOLDERS
Hans Wiederkehr, Ifangstrasse 107, Rumlang, Switzerland
Filed Oct. 17, 1968, Ser. No. 768,402
Claims priority, application Switzerland, Oct. 18, 1967, 14,552/67
Int. Cl. B23b *31/02*
U.S. Cl. 279—16 **6 Claims**



A tool holder for use with machine tools having means for permitting the axis of rotation of the tool to become offset from the axis of rotation of the tool holder. This

is accomplished by providing a coupling plate with ball bearings on either side between the driving part and the driven part of the tool holder. The tool holder maintains the offset axes in absolute parallelism with each other.

3,567,236
WHEELCHAIR ATTACHMENT
Samuel T. Powers, Tijeras, N. Mex., assignor to Lovelace Foundation for Medical Education and Research, Albuquerque, N. Mex.
Filed Nov. 25, 1968, Ser. No. 778,458
Int. Cl. B62b *5/02*
U.S. Cl. 280—5.32 **7 Claims**

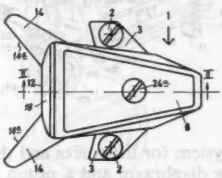


Wheelchair attachments ordinarily installed in pairs for enabling patients confined to wheelchairs to easily negotiate obstacles, such as curbs, in a conventional wheelchair having two small front wheels and two large rear wheels which the patient manually rotates to propel and maneuver the wheelchair. Each attachment includes an extendible wheels, or dolly, which is connectable to the wheelchair through supporting member and which can be manually extended backward by the patient to a locked position. When both dollies of a pair of attachments are in this extended and locked position, the wheelchair can be tilted backwards manually to rest in a stable, tilted position on the two large wheels and the extended dollies or wheels with the two small front wheels, or casters, elevated. Curbs and other obstacles can then be simply negotiated in this tilted position by manually rotating the two large wheels so as to climb the obstacle.

3,567,237
SKI COVERING
Herbert Bernette Miller III, Minneapolis, Minn., assignor to A-Line Company, Minneapolis, Minn.
Continuation-in-part of application Ser. No. 738,956, June 21, 1968. This application Oct. 29, 1968, Ser. No. 771,481
Int. Cl. A63c *5/12*
U.S. Cl. 280—11.13 **2 Claims**

A tough protective covering secured to the upper surface of the runner member of the ski by a pressure-sensitive adhesive to form a scuff resistant membrane over the runner member. The protective covering may be transparent, colored, or contain a wood grain figure. In certain instances, additional symbols, letters, words, or other indicia may be applied to the ski covering and the combination covered with a transparent covering. The covering alleviates the problem of continually refinishing the upper surface of the ski.

3,567,238
FRONT JAW OF SAFETY BINDING FOR SKIS
Rudolf Brunner, Munich, Germany
(23 Wankstrasse, 8011 Baldham, Germany)
Filed Mar. 19, 1969, Ser. No. 808,545
Claims priority, application Germany, Mar. 27, 1968, P 17 03 068.1
Int. Cl. A63c *9/00*
U.S. Cl. 280—11.35 **14 Claims**



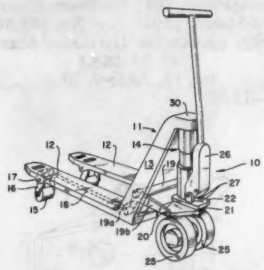
In the front jaw of a safety binding for skis in which a jaw body is swingable laterally relative to the ski from an operative position where it is yieldably retained and a pair of diverging holddown arms project rearwardly from the body at opposite sides of a central supporting face thereon to engage lateral areas of the toe portion of a ski boot when the toe end of its sole abuts such face; the holddown arms are in the form of a rigid unit releasably secured with respect to the jaw body, as by a screw and slot connection, to permit adjustment of such rigid unit forwardly and rearwardly with respect to the jaw body and the supporting face thereon. Preferably, the rigid arm unit is connected to the jaw body by way of an intermediate member presenting the central supporting face and being vertically adjustable on the jaw body.

3,567,239
SKIING INSTRUCTIONAL DEVICE
Donald M. Kitterman, 4100 Riverside St., Kansas City, Mo. 64105
Filed Feb. 26, 1969, Ser. No. 802,454
Int. Cl. A63c *11/00*
U.S. Cl. 280—11.37 **10 Claims**

A skiing instructional device consisting of cooperative members on the forward end of each of a pair of skis and having loosely engaging connecting portions with openings adapted to receive a pointed end of the

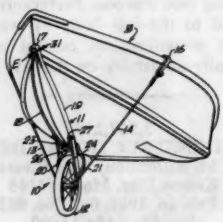
ski pole for separably connecting same and preventing the forward ends of the skis from moving or spreading apart.

3,567,240
DUAL RATE JACK SYSTEM FOR LIFT TRUCKS
Samuel M. Brassington, 1101 Kenwal Road, Concord, Calif. 94521
Filed Apr. 11, 1969, Ser. No. 815,460
Int. Cl. B66f *9/06*
U.S. Cl. 280—43.12 **10 Claims**



A jacking system for lift trucks and the like which employs a rolling diaphragm and a piston unit to achieve a dual jacking rate, a fast rate in an unloaded condition and a slower rate, with increased mechanical advantage, for loaded conditions on the jacking system.

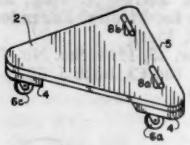
3,567,241
DETACHABLE BOAT WHEELING DEVICE
John A. Foschino, 44 E. Pleasant Ave., Maywood, N.J. 07607
Filed Feb. 24, 1969, Ser. No. 801,487
Int. Cl. B60p *3/10*
U.S. Cl. 280—47.32 **2 Claims**



A detachable boat wheeling device comprising a carriage framework of bent metal bar stock defining at one end a bight having through pin connection means for straddling and interconnection with a boat prow eye, and extending into opposed, coextensive spaced prow supporting side portions the lower ends of which are bent downwardly and support between them a wheel. Cables extending upwardly of each side of the framework terminate in hooks attachable over the gunwale at each side of a boat.

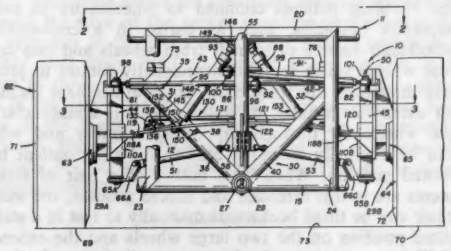
3,567,242
WHEELED COASTER DEVICE
Larry F. Miller, 366 Tolbert St., Wadsworth, Ohio 44281
Filed June 26, 1969, Ser. No. 836,866
Int. Cl. B62b *11/00*
U.S. Cl. 280—87.04 **7 Claims**

A coaster device is composed of a platform beneath which are mounted three wheels, arranged in the form of a triangle. Two of the wheels are each provided with separate steering means while the third wheel is free to pivot about its vertical axis. The platform is preferably triangular and is of sufficient size and strength to support one or more persons in a sitting or kneeling position.



Casters are preferably used for the wheels. The caster stems for the two steerable wheels are each keyed to one end of a tubular shaft extending vertically through the platform. A suitable handle is attached to the other end of each shaft.

3,567,243
VEHICULAR UNDERCARRIAGE AND SUSPENSION
John B. Ruhlin, Akron, Ohio, assignor to The John G. Ruhlin Construction Company, Akron, Ohio
Filed July 2, 1969, Ser. No. 838,441
Int. Cl. B62d *7/00*
U.S. Cl. 280—96.2 **20 Claims**



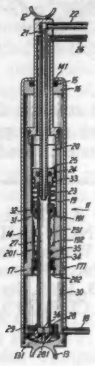
An undercarriage and suspension system for a vehicle. The vehicle chassis has a longitudinal roll axis delineated by a mounting beam. An axle is rotatably connected to the mounting beam and a pillar is dependingly supported from a pivot means on each lateral end of the axle. One end of a pair of control rods, each adjustable for length, is connected to each pillar in spaced relation below the pivot means, and the opposite ends of the control rods are individually secured to the chassis at selective locations upwardly of the mounting beam but at least beneath the center of gravity of the sprung mass of the vehicle. Spindle means on each pillar support the wheels and, for steering, each pillar may be rotatable about its own axis by the rods connected between steering arms on the pillars and a compensating member rotatably mounted on the axle. In order to provide the effect of independent suspension, the spindle means are secured to sleeves slidably supported on the pillars. An equalizer beam is rotatably mounted on the axle about an axis generally transversely of the pillars and is operatively connected between the sleeves mounted on those pillars. A spring means is also operatively connected between the sleeves and the chassis, and, in some embodiments a spring means may be operatively connected between the sleeves and a stanchion rotatably secured to the mounting beam.

3,567,244

LEVEL REGULATING UNIT

Hans-Jürgen Hoffmann, Hohenlimburg, and Manfred Löhr, Letmathe, Germany, assignors to Hoesch Aktiengesellschaft, Dortmund, Germany

Filed Nov. 20, 1968, Ser. No. 777,394
Claims priority, application Germany, Nov. 23, 1967, P 16 30 067.7
Int. Cl. B60g 17/04
U.S. Cl. 280—124 14 Claims



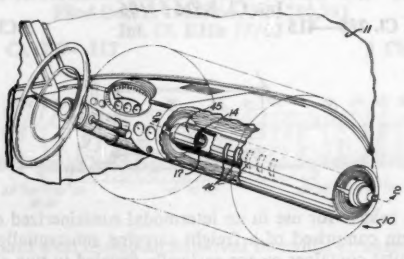
A level regulating unit for pneumatic or hydro-pneumatic springs, especially for automotive vehicles having a chassis assembly and a wheel assembly movable in substantially vertical direction toward and away from each other thereby increasing the gas pressure of the springs during movement of the assemblies toward each other and reducing the gas pressure during movement of the assemblies away from each other. The level regulating unit includes a pair of telescopically arranged members respectively connected to the chassis and the wheel assembly for movement in vertical direction therewith and defining a working space communicating with the fluid space of the springs, and control means for connecting the working space to a high pressure space when the telescoping members move in one direction relative to each other, or to a low pressure space during movement of the members in the opposite direction.

3,567,245

VEHICLE SAFETY APPARATUS

George A. Ekstrom, Southfield, Mich., assignor to Eaton Yale & Towne Inc., Cleveland, Ohio

Filed May 17, 1968, Ser. No. 730,024
Int. Cl. B60r 21/08
U.S. Cl. 280—150 21 Claims



A vehicle safety apparatus protects an occupant of a vehicle during a collision. The safety apparatus includes a confinement which is inflated by the flow from a fluid reservoir and, when inflated, restrains movement of an occupant of the vehicle during the collision. The reservoir includes an opening therein and a plug member is located in the opening. The plug member has a fluid passageway extending therethrough and means for blocking the flow of fluid from the reservoir through the fluid passageway. An explosive is located in the fluid passageway and on detonation provides for flow of fluid through the fluid passageway from the reservoir to the confinement.

3,567,246

SAFETY STEERING WHEEL

Karl Wilfert, Gerlingen-Waldstadt, and Béla Barényi, Stuttgart-Vaihingen, Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Sept. 18, 1968, Ser. No. 760,399
Claims priority, application Germany, Sept. 19, 1967, D 54,151
Int. Cl. B60r 21/02
U.S. Cl. 280—150 8 Claims

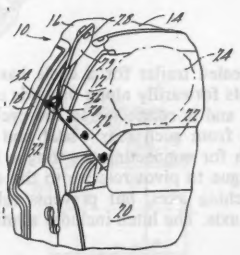
A safety steering wheel for motor vehicles, particularly for passenger motor vehicles, in which the system "steering wheel-steering wheel spokes" is constructed relatively form-rigid and is arranged at the upper end of a steering column by the interposition of a yielding intermediate structure which is constituted by an elastically yielding transmission member yielding in the direction of the steering column, and an energy-dissipating element is associated with this transmission member.

3,567,247

VEHICLE SHOULDER HARNESS ARRANGEMENT

William J. Sobkow, Livonia, and Emile P. Grenier, Ann Arbor, Mich., assignors to Ford Motor Company, Dearborn, Mich.

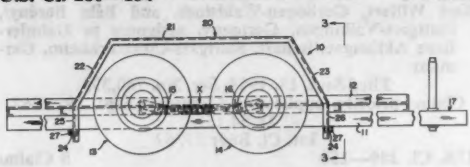
Filed July 24, 1969, Ser. No. 844,429
Int. Cl. B60r 21/10
U.S. Cl. 280—150 8 Claims



A motor vehicle shoulder harness type occupant restraint arrangement including an outboard belt segment having one of its ends secured to vehicle body structure above and rearward of a forward facing passenger seat. A first fastener element carried by and movable along the length of this belt segment is adapted to be releasably engaged by a fixed second fastener element located within the vehicle passenger compartment at a

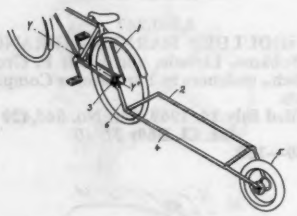
point forward of and below the belt segment anchoring point. In the event of rapid vehicle deceleration causing a seated passenger to move forward against the belt segment, the resultant belt segment loading would cause the fastener elements to separate.

3,567,248
TRAILER WITH MULTIPOSITION FENDERS
John N. Nuzum, Barberton, Ohio, assignor to Travel-Safe Trailer Mfg., Inc., Akron, Ohio
Filed Apr. 30, 1969, Ser. No. 820,526
Int. Cl. B62d *25/16*
U.S. Cl. 280—154 **3 Claims**



The trailer includes a frame having longitudinally extending side members thereon, support wheels operatively attached to the frame and positioned laterally beyond the frame, and individual fender means provided for each of the support wheels in the trailer. These fenders are carried operatively by the trailer frame and are adapted to be positioned operatively above the support wheels for the trailer and to be swung laterally outwardly to inoperative position to facilitate loading and unloading of the trailer.

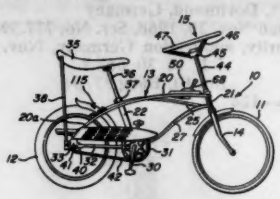
3,567,249
ONE-WHEELED CYCLE TRAILER AND HITCH THEREFOR
Russell S. Robinson, 277 Main St., Farmington, Conn. 06032
Filed Mar. 18, 1969, Ser. No. 808,058
Int. Cl. B62d *53/00*
U.S. Cl. 280—204 **10 Claims**



A one-wheeled trailer for a cycle has a single tongue which extends forwardly along one side of the rear wheel of the cycle and is connected to the cycle at a point laterally offset from such rear wheel and near its central axis. A hitch for connecting the tongue to the cycle permits the tongue to pivot relative to the cycle about turning and pitching axes, but prevents relative movement about a roll axis. The hitch includes a quick disconnecting means.

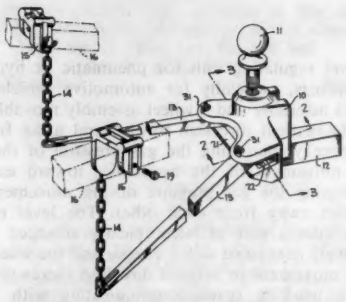
3,567,250
BICYCLE WITH IMPROVED BRAKE SYSTEM
Donald A. Wolf, Dayton, Ohio, assignor to The Huffman Manufacturing Company, Dayton, Ohio
Filed Mar. 12, 1969, Ser. No. 806,470
Int. Cl. B62j *27/00*
U.S. Cl. 280—289 **6 Claims**

A bicycle has a brake actuator including a housing mounted on twin upper tubes of the frame below an automotive type steering wheel or a handlebar. A pivotable lever is supported by the housing between the tubes and is connected by a shielded cable to caliper brakes for the rear wheel of the bicycle. The lever is effective to lock



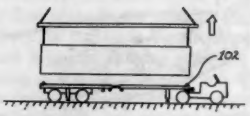
the rear wheel against rotation for providing a parking brake. The housing may also support a second pivotable lever connected to actuate a speed change mechanism.

3,567,251
EQUALIZING TRAILER HITCH
John Broocks Dalton, Warsaw, Ind., assignor to Big Boy Products, Inc., Winona Lake, Ind.
Filed May 13, 1969, Ser. No. 824,167
Int. Cl. B62d *53/00*
U.S. Cl. 280—406 **6 Claims**



A trailer hitch coupling usable with equalizing bars pivotally mounted therein, the coupling having wedge means therein for both maintaining the bars securely within the coupling and for accommodating different sizes of equalizing bars.

3,567,252
VEHICLE FORMED BY COUPLABLE CONTAINER MEANS WITH DEMOUNTABLE COUPLABLE ADAPTER FRAMES
Ronald L. Zubko, Levittown, Pa., assignor to Strick Corporation, Fairless Hills, Pa.
Filed Dec. 12, 1968, Ser. No. 783,380
Int. Cl. B62d *53/06*
U.S. Cl. 280—415 **3 Claims**



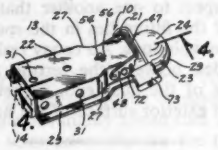
A vehicle for use in an intermodal containerized cargo system comprised of a freight carrying substantially rectangular container means vertically coupled to two adapter or chassis frames which are themselves releaseably connected together in horizontal longitudinal end-to-end relationship, a pair of wheeled bogies mounted for sliding longitudinal movement between said adapter frames,

and a landing gear and a kingpin mounted on each frame in positions to allow movement of the bogies.

The adapter frames may be coupled together forming a first configuration tandem axle semi-trailer carrying a container means comprising two separate van size cargo containers in end-to-end abutting relationship, may be coupled together forming a second configuration tandem axle semi-trailer carrying a container means comprising two van size cargo containers which are themselves coupled together horizontally in end-to-end relationship to form a unitary dual container which spans both adapter frames, or may be coupled together forming a third configuration tandem axle semi-trailer carrying a container means comprising a single van size cargo container approximately equal in outside dimensions to the container means of the second configuration and spanning both adapter frames.

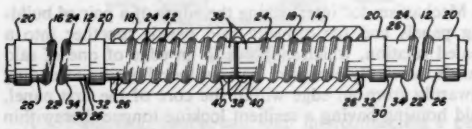
When the adapter frames form the first and second configurations, the adapter frames may be uncoupled and their containers separated to form two single body, single axle semi-trailers.

3,567,253
VEHICLE COUPLER UNIT
Frank A. De Puydt and Eugene P. Conradi, Des Moines, Iowa, assignors to Dico Company, Inc., Des Moines, Iowa
Filed June 13, 1969, Ser. No. 832,949
Int. Cl. B60d *1/06*
U.S. Cl. 280—512 **7 Claims**



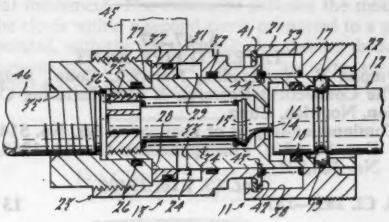
The vehicle coupler unit includes a housing that is formed at one end with a ball-receiving socket and is attachable at its opposite end to a vehicle to be towed. A ball member on the towing vehicle is retained within the socket by a locking member that is pivotally mounted within the housing for movement between coupling and uncoupling positions. A cam member engageable with the locking member is manually actuated in one direction to provide for a movement of the locking member to an uncoupling position and is constantly spring urged in an opposite direction to engage and move the locking member to a coupling position.

3,567,254
DRILL STEEL
Toimi A. Parssinen, R.F.D. 1–165, Newport, N.H. 03773
Filed Dec. 3, 1968, Ser. No. 780,791
Int. Cl. E21b *17/02*
U.S. Cl. 287—117 **3 Claims**



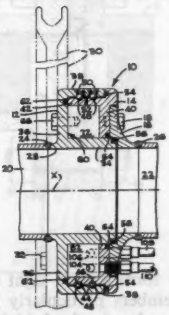
A drill steel having an improved threading arrangement thereon wherein a plurality of spaced threaded portions are provided on the drill steel element and separated by unthreaded portions so as to allow removing a worn section of the element and recoupling the element with another of said threaded portions.

3,567,255
QUICK ACTING FLUID COUPLING
Bryce B. Evans, Jackson, Mich., assignor to Aeroquip Corporation, Jackson, Mich.
Filed Nov. 21, 1968, Ser. No. 777,660
Int. Cl. F16l *37/22, 37/28*
U.S. Cl. 285—1 **1 Claim**



A fluid coupling having interfitting male and female bodies. The female body carries radially movable detents to lock the male body in position, the detents being held inwardly by sleeve means. Both bodies have spring-pressed fluid retaining valves which are opened when the bodies interfit but close when they are disconnected. The female body has an outer fixed section connected to the sleeve means and an inner movable section which carries the detents. The outer section is connected by a rigid conduit to the fluid line. To disconnect the coupling, the male body and inner section of the female body are moved with respect to the outer section and sleeve means until the detents are freed. In one embodiment, the sleeve means is manually retractable to release the detents for connecting or disconnecting the bodies. In the second embodiment, the sleeve means is part of the outer female body section, and an annular overcenter spring maintains the two sections of the female body either in a detent locking position or in a position with the detents freed, so that it is unnecessary to manually retract the sleeve means in order to reconnect the bodies.

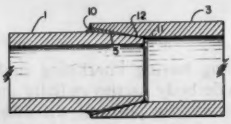
3,567,256
POWERED SWIVEL PIPE JOINT
Frank Haley, Upland, Calif., assignor to FMC Corporation, San Jose, Calif.
Filed Dec. 13, 1968, Ser. No. 783,639
Int. Cl. F16l *55/00*
U.S. Cl. 285—119 **8 Claims**



A swivel pipe joint having a fluid-powered motor for rotating one of the joints, two relatively rotatable members with respect to the other, and hence one of the pipe sections, to which the joint might be connected, with

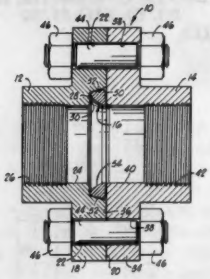
respect to the other section. The joint is designed so that either of these members can be rotated while the other is stationary, and provision is made for connecting a sheave, sprocket, gear, or the like to either member for transmitting the rotary motion to another element in addition to the connected pipe section.

3,567,257
TAPERED PIPE JOINT
Raymond F. Nowosadko, Norwich, Conn., assignor to The Connecticut Research & Manufacturing Corporation, Norwich, Conn.
Continuation-in-part of application Ser. No. 514,244, Dec. 16, 1965. This application Oct. 11, 1968, Ser. No. 766,831
Int. Cl. F16l *13/00*
U.S. Cl. 285—287 **13 Claims**



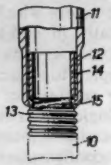
A pipe joint wherein a tapered external surface of a pipe end is bonded within a tapered internal surface of a fitting end by a sleeve of solder material extending the length of the tapered surfaces. The angle of the internal taper is greater than the angle of the external pipe taper with respect to the longitudinal axis of the pipe joint so that a line contact is formed between the tapered surfaces. The solder material is in the form of a pre-formed tapered annular insert which is positioned between the tapered surfaces and has a length slightly greater than the lengths of the tapered surfaces. Fillets are formed from the ends of the insert of solder material at each end of the joint.

3,567,258
SEAL ASSEMBLY
Domer Scaramucci, 3245 S. Hattie, Oklahoma City, Okla. 73129
Filed Mar. 10, 1969, Ser. No. 805,742
Int. Cl. F16l *25/00*
U.S. Cl. 285—334.4 **33 Claims**



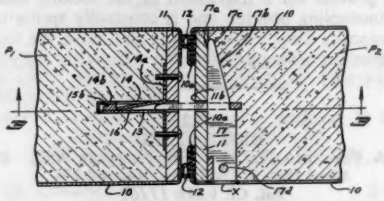
A seal ring to form a fluid tight seal between a pair of connecting members particularly useful in high pressure applications, wherein the initial sealing engagement is established by causing various internal mechanical stresses in the seal ring, and wherein the seal ring is disposed between the connectors such that the load caused by tightening the bolts between the connectors is not carried by the seal ring, and such that the seal ring may quickly and easily be removed for replacement or repair.

3,567,259
SHRUNK FIT TUBE COUPLING
Brian Benson, Winnersh, near Wokingham, and Ian Martin Cleare, High Wycombe, England, assignors to Smiths Industries Limited, London, England
Filed Oct. 3, 1968, Ser. No. 764,776
Int. Cl. F16l *13/10, 47/02*
U.S. Cl. 285—381 **6 Claims**



A union between a fitting and a convoluted plastics hose comprising an irradiated shrink-down material for the fitting and a hollow rigid cylindrical ferrule of nylon or aluminium alloy within a smooth non-convoluted end of the hose whereby the ferrule restrains deformation of the hose end when the fitting is shrunken over it. The convolutions are removed from the hose end and the end is formed with an external diameter equal to the external diameter of the convolutions by stretching the end of the hose over a heated mandrel and applying a tool to the hose end exterior surface. The fitting in its pre-formed expanded state and the hose may be so positioned with respect to one another that after shrinking an end edge of the fitting lies in the space between two neighbouring convolutions. An epoxy resin adhesive layer may be provided between the ferrule and the smooth interior surface of the hose end, or between the fitting and the smooth exterior surface of the hose end, or both.

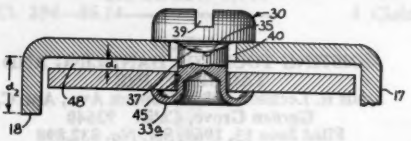
3,567,260
MECHANISM FOR PULLING TOGETHER AND INTERLOCKING THE EDGES OF INSULATED BUILDING PANELS
Lannie F. Norris, Hot Springs, Ark., assignor to Norris Dispensers, Inc., Minneapolis, Minn.
Filed Mar. 21, 1969, Ser. No. 809,067
Int. Cl. F16b *9/00*
U.S. Cl. 287—20.924 **3 Claims**



Mechanism for interlocking the edges of a pair of building panels and for drawing said panels together into a sealed relation, which employs in an edge of one of said panels, a wholly enclosed, narrow lock housing extending inwardly from an edge within the core of the first panel, said housing having a resilient locking tongue therewithin and normally extending at an acute angle to a side of said housing with a free edge. The mechanism includes in combination a slidable bolt plate of slightly smaller cross sectional configuration than said narrow channel, wherein said bolt plate is slidable into said channel and in such sliding insertion, cams the locking tongue first outwardly until the locking tongue is positioned in a recessed portion

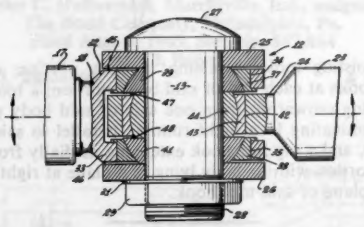
of said bolt plate, thereupon abutting an edge of said bolt plate to securely interlock the same with said housing. The mechanism is further supplemented by an aligned slot in the edge face plate of the second panel to be joined, through which a projecting end of said bolt plate is received and preferably thereafter, an additional wedge member is employed, driven perpendicularly to said bolt plate through an apertured longitudinal portion thereof to by wedge action on said bolt plate, and more particularly on the longitudinal slot thereof, pull or draw the two panels together into a sealed relationship. Multiples of said mechanism are utilized in vertical spaced relation upon the upright edges of panels to be joined, as well as in horizontally spaced relation at the upper edges and lower edges of the upright panels to secure the same to ceiling and floor panels.

3,567,261
ADJUSTABLE SLIP JOINT
Joseph J. Akczinski, Glen Burnie, Md., assignor to Eastern Products Corporation, Baltimore, Md.
Filed Aug. 6, 1968, Ser. No. 750,608
Int. Cl. F16d *19/00*
U.S. Cl. 287—64 **4 Claims**



A slip joint for adjustably connecting two members together including a rivet of special construction in which the head has a pair of radially alined cam surfaces on the underside and a screwdriver slot on the top so that the rivet can be turned between a tight condition in which the cam surfaces are crosswise with respect to a slot in one of the pieces and a loose condition in which the cam surfaces drop into register with the slot for readjustment of the effective length.

3,567,262
SELF-ALIGNING DOUBLE-BALL JOINT
Edward J. Szkaradek, Santa Ana, and Donald L. Nepp, San Pedro, Calif., assignors to Western Hydraulics, Inc.
Filed May 2, 1969, Ser. No. 821,395
Int. Cl. F16c *11/06*
U.S. Cl. 287—88 **7 Claims**

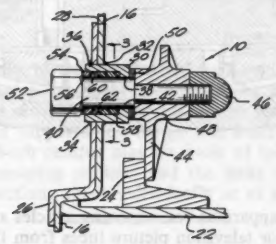


A self-aligning, double-ball joint interconnecting a pair of actuator rods including a clevis on the end of one rod in the opposite legs of which are concave bearing rings in which are mounted split segments of a bearing ball having central openings therethrough. The second actuator rod has a torque on its end providing an enlarged flat eye which is mounted in the clevis and has a bearing ring pressed, swaged or otherwise rigidly secured therein, the ring presenting a concave surface and being swaged about a central bearing ball therein. The bearing ball has a central opening therethrough and the ball and ball segments are rigidly connected together by a through bolt, with spaces provided between the clevis and the tongue therein to permit free relative twisting, as well as rotational movement. The disclosure includes the mounting of the clevis within a second clevis connected to a part to be operated, with the through bolt also passing through the last-mentioned clevis. The clevises are also spaced apart to permit relative twisting movement therebetween.

ERRATUM

For Class 287—117 see:
Patent No. 3,567,254

3,567,263
DOOR LATCH ASSEMBLY FOR SIDE DOOR DISCHARGE BINS
Ralph E. McKinney, Beatrice, Nebr., assignor to Hoover Ball and Bearing Company, Saline, Mich.
Filed Nov. 29, 1968, Ser. No. 779,790
Int. Cl. E05c *3/04, 13/00*
U.S. Cl. 292—241 **5 Claims**



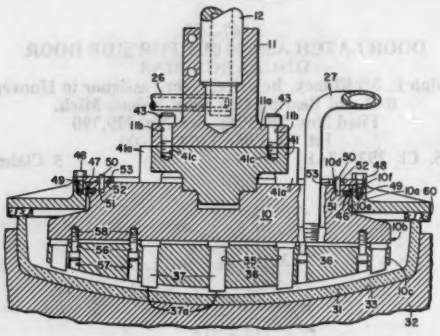
A latch assembly for a hinged side door in a bin for bulk materials wherein a split sleeve is assembled with a latch bolt so that when the door is latched, a tight seal is provided around the latch bolt to prevent leakage of the bin contents.

3,567,264
IMPLEMENT FOR REMOVING INDENTATIONS IN TURF OR ON GOLF GREENS
Glen L. Baber, Rte. 2, Chariton, Iowa 50049
Filed Feb. 3, 1969, Ser. No. 795,848
Int. Cl. A01b *1/16;* **A01d** *9/06, 11/00*
U.S. Cl. 294—50.7 **10 Claims**

This implement is designed to remove indentations from turf and ball marks from putting greens, by centering the implement over the indentations and by then pushing downwardly on the handle to move six angular blades downwardly and inwardly in a vertical position

through the surface of the turf to converge about the indentation or ball mark, whereby the coaction of the blades about the indentation will relieve compaction of the earth, realign grass and grass roots and force the earth upwardly and inwardly thereabout to raise the turf and fill the indentation.

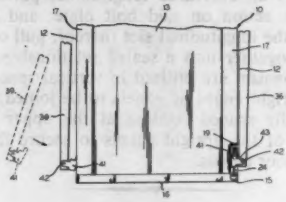
3,567,265
APPARATUS FOR REMOVING GLASS VIEWING PANELS FROM A MOLD
Wendell S. Blanding, Painted Post, N.Y., and Richard F. Kruger, Saratoga, Calif., assignors to Corning Glass Works, Corning, N.Y.
Filed Apr. 29, 1968, Ser. No. 724,866
Int. Cl. B66c *1/02*; C03b *11/00*
U.S. Cl. 294—65 **6 Claims**



Takeout apparatus for removing articles such as viewing panels for television picture tubes from their forming molds by the use of negative pressure or vacuum and without distortion of such articles. The apparatus comprises a vacuum head having an annular outer member whose bottom surface contacts the sealing edge of each formed panel, and an inner member supporting a plurality of downwardly extending spaced-apart posts or pedestals of varying lengths on the bottom of such inner member, the free ends of such posts being shaped to correspond to selected areas on the inner surface of the face plate portion of each of said panels, said areas being drawn into contact with said ends of said posts when said inner member moves into the interior of each respective panel until said bottom surface of said outer member contacts the sealing edge of the respective panel and vacuum or negative pressure is supplied through the inner member to the interior of such panel. The outer member closely encompasses the outer periphery of said inner member in a snug but slidable relationship therewith and with a substantially airtight seal therebetween. The posts on the bottom of said inner member prevent distortion of the panels when said vacuum is supplied to the interior thereof.

3,567,266
FREIGHT CONTAINER AND GRIPPING AND LIFTING ATTACHMENT THEREFOR
John Bridge, 407 S. Dearborn St., Chicago, Ill. 60605
Filed Oct. 15, 1968, Ser. No. 767,723
Int. Cl. B66c *1/66*
U.S. Cl. 294—67 **6 Claims**

Container for freight having lifting attachments adapted for tong lifting devices. The container has rectangular parallel vertical side and end walls and a reinforcing beam structure extending about the bottom of the container. The side walls have gripping recesses therein spaced longitudinally therealong and forming receptacles for lift members connected with the bottom side beams of the container. Lift blocks, on the lower ends of conventional lift tongs are moved into engagement with the lift members by the tongs, to lift the container vertically upon vertical lifting movements of the



tongs. In the principal form of the invention, the lift members are connected with the bottom side beams of the container through flexible draft devices. In another form of the invention, the lift members are directly connected with the bottom side beams of the container and have lifting sockets therein.

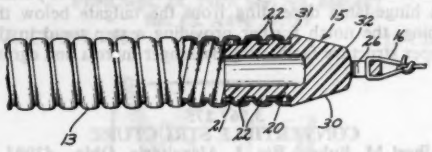
3,567,267
HOISTING TOOL FOR HANDLING AND TAGGING LINE
Louis R. Lechner, 13812 Dawson Ave., Apt. C, Garden Grove, Calif. 92640
Filed June 13, 1969, Ser. No. 832,898
Int. Cl. F16g *11/00*
U.S. Cl. 294—78 **3 Claims**

A hoisting tool comprising: a body portion; coaxial snap hooks at each end of said body portion; a tool hook projecting outwardly from one side of said body portion and terminating in a bight running parallel to said body portion, and a tag line hook extending medially from said body portion with its body lying in a plane at right angles to the plane of said tool hook.

3,567,268
FLEXIBLE CONDUIT PULLING MEANS
Donald E. Peterson, Box 218, Medford, Minn. 55049
Filed Dec. 18, 1968, Ser. No. 784,821
Int. Cl. B25b
U.S. Cl. 294—86 **2 Claims**

A body having a cylindrical portion with outside threads thereon adapted to threadedly engage a flexible conduit, a shroud or conical portion for protecting the end of the

conduit from catching and for directing the end of the conduit into and through the various openings, and an eye

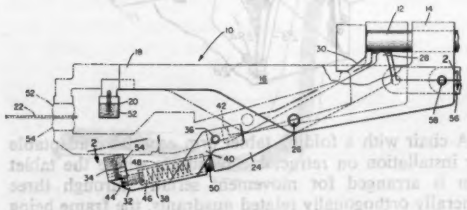


at one end adapted to receive a flexible cord therethrough for pulling the conduit.

3,567,269
COUPLING DEVICE FOR CONNECTING THE WIRE WITH THE INNER CORE TUBE IN WIRE LINE CORE DRILLS
Öyvind Jensen, Stockholm, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden
Filed June 25, 1969, Ser. No. 836,331
Claims priority, application Sweden, July 2, 1968, 9,108/68
Int. Cl. E21b *31/00*
U.S. Cl. 294—86.14 **4 Claims**

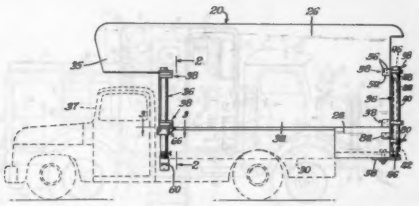
This invention relates to a coupling device for connecting the wire with the inner core tube in wire line core drills, including a locking mechanism comprising at least one lever, one arm of which is intended to engage with a gripper means attached to said wire.

3,567,270
VARIABLE PRESSURE GRAB HAND
Charles C. Halberstadt, Merrillville, Ind., assignor to The Budd Company, Philadelphia, Pa.
Filed Aug. 6, 1969, Ser. No. 847,864
Int. Cl. B66c *1/00*
U.S. Cl. 294—104 **4 Claims**



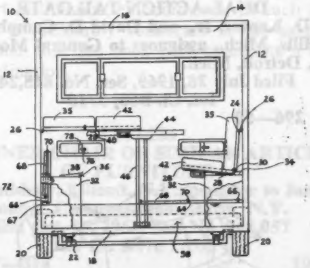
A cam operated grab hand for grasping and holding a work piece for removal of the work piece from a metal working machine. One finger of the grab hand is mounted on and movable with a control arm and the other finger is pivotally secured to the first finger for being pivoted into engagement therewith by a cam secured to the control arm. A spring biasing means may be adjusted to vary the pressure of the grip applied to the work piece by the pivotal engagement of the second finger with the first.

3,567,271
LOADING, UNLOADING AND LEVELING MEANS FOR CAMPERS AND THE LIKE
Frank T. Gostomski, 3019 54th Ave. E., Tacoma, Wash. 98424
Filed Aug. 19, 1966, Ser. No. 573,708
Int. Cl. B60p *3/32*
U.S. Cl. 296—23 **3 Claims**



Camper units of the type carried on a vehicle are provided with extensible jacks secured to the camper and have portions movable so that the camper may be raised or lowered or supported on the ground independently of the vehicle. Such camper may be made of independently movable telescoping sections and the jacks arranged to elevate the sections either individually or as a unit.

3,567,272
CONVERTIBLE DINING AND SLEEPING FACILITIES FOR VEHICLES
Lester L. Low, 1120 S. Pacific Highway, Talent, Oreg. 97540
Filed Apr. 3, 1969, Ser. No. 813,174
Int. Cl. B60p *3/32*
U.S. Cl. 296—23 **10 Claims**



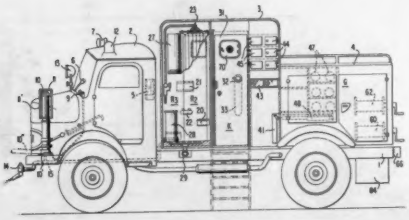
A compact mobile vehicle is designed alternatively to provide generous dining and sleeping facilities in a limited space, with a minimum of inconvenience. The vehicle has at one end a dining table flanked by benches, the back and seat portions of which benches can be rearranged to provide an upper bed support, resting on, and affixed to, the table. A lower bed is also provided under the table in a housing of ample capacity to contain the lower mattress, and the bedding of both the upper and lower beds, the housing including a sectional cover which is normally

closed and dirt-tight and provides a tread surface for persons seated at the table, but is arranged to be folded back and secured out of the way when the beds are to be used.

3,567,273
SPECIAL VEHICLE FOR FIGHTING DAMAGES IN TERRAINS CONTAMINATED WITH ABC SUBSTANCES

Willy Haas, Nellingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Nov. 17, 1966, Ser. No. 595,180
Claims priority, application Germany, Nov. 17, 1965, D 32,298
Int. Cl. B60r *23/00*
U.S. Cl. 296—24 **10 Claims**



A vehicle for use in areas contaminated with atomic, biological and chemical substances or war materials, having a driver cab provided with built-in communication equipment and devices for determining radiation levels existing in the immediate environment of the vehicle, a center section having radiation-measuring apparatus and one or more devices for cleaning contaminated persons or objects, and a rear body section having water tanks, pumps and other necessary equipment.

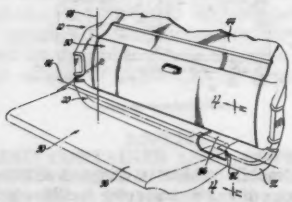
ERRATUM

For Class 296—50 see:
Patent No. 3,567,209

3,567,274
DUAL-ACTION TAILGATE

Vincent D. Kaptur, Jr., and David D. Campbell, Bloomfield Hills, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed July 28, 1969, Ser. No. 845,244
Int. Cl. B60j *5/10*
U.S. Cl. 296—50 **3 Claims**

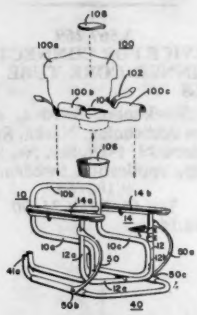


A station wagon type vehicle has a dual-action tailgate swingable thereon between open and closed positions either as a door about a generally vertical axis situated at one side of the tailgate opening or as a drop-gate about a generally horizontal axis situated below the tailgate opening, and has a rear bumper structure immediately below the tailgate opening and extending vertically through the horizontal plane of the horizontal swinging axis. The bumper structure includes a narrow notch formed therein to receive in the closed position of the tailgate a portion of a hinge-latch depending from the tailgate below the opening, the notch further providing a step tread in the bumper structure facilitating passenger ingress and egress.

3,567,275
CONVERTIBLE STRUCTURE

Albert M. Bukey, Rte. 1, Alexandria, Ohio 43001

Filed Feb. 10, 1969, Ser. No. 797,911
Int. Cl. A47c *13/00*; A47d *1/08, 1/04*
U.S. Cl. 297—133 **17 Claims**

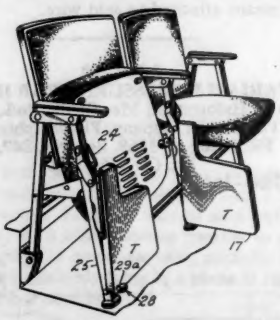


A convertible structure comprising three primary components and a minimum number of secondary components that permits the construction from a first utilitarian device into one of several others with only an insignificant number of changes.

3,567,276
CHAIR WITH FOLDING TABLET ARM

Arthur L. Van Ryn, Grand Rapids, Mich., assignor to American Seating Company, Grand Rapids, Mich.

Filed Mar. 24, 1969, Ser. No. 809,531
Int. Cl. A47b *39/00*
U.S. Cl. 297—162 **8 Claims**

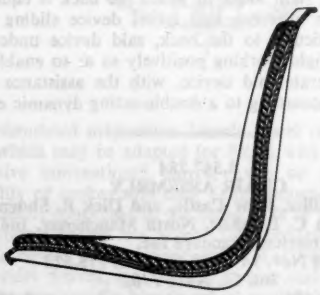


A chair with a folding tablet arm especially adaptable for installation on retractable bleachers where the tablet arm is arranged for movement serially through three generally orthogonally related quadrants, the frame being equipped with lock means for maintaining the tablet arm in a stored position, and further serving as a bumper when the chair is completely collapsed and retracted within a storage recess in the bleacher.

3,567,277
FOLDING TABLET ARM FOR CHAIR
Arthur L. Van Ryn, Grand Rapids, Mich., assignor to American Seating Company, Grand Rapids, Mich.
Filed Sept. 24, 1969, Ser. No. 860,487
Int. Cl. A47c *39/00*
U.S. Cl. 297—162 **12 Claims**

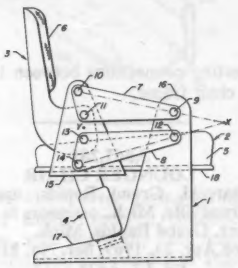
A tablet arm is pivotally mounted on a channel hinge which in turn is connected by link members to a fixed bracket carried by a chair support bar, the link members controlling the movement of the hinge to a lower folded position and to an upper tablet arm support position while bracing and locking the hinge in the support position.

3,567,278
UPHOLSTERED BUCKET SEAT
Chester J. Barecki and Arthur J. Hogan, Jr., Grand Rapids, Mich., assignors to American Seating Company, Grand Rapids, Mich.
Filed Apr. 21, 1969, Ser. No. 817,952
Int. Cl. A47c *7/02, 27/16*
U.S. Cl. 297—218 **5 Claims**



A bucket seat is upholstered by employing a contoured rigid support fitting into the bucket portion of the seat, and a resilient or foam pad is bonded to the top surface of the support and a fabric web is stretched around the foam pad and the edges bonded to the rear side of the support. The pad may be extended about the front edge of the seat and the web covering anchored below the seat, or the pad and cover web may be terminated short of the front edge of the seat. Releasable securing means anchor the support with its pad and web upon the bucket seat.

3,567,279
VEHICLE SEAT
Garth O. Hall, New Berlin, and Arthur O. Radke, Milwaukee, Wis., assignors to Universal Oil Products Company, Des Plaines, Ill.
Filed July 9, 1969, Ser. No. 840,379
Int. Cl. A47c *3/00*
U.S. Cl. 297—309 **11 Claims**

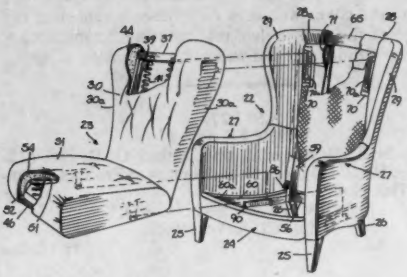


A seat comprising a base part having a vertically extending portion and a seat part biased apart and connected by upper and lower links on each side. All of the links are pivotally connected to the base part and to the seat part. The upper links slope upward to the rear and the lower links slope downward to the rear, whereby linear extensions of said upper and lower links would converge and intersect generally in the area of the knee of an occupant of the seat. On each side of the seat the vertical component of distance between the rear ends of the upper and lower links is greater than the vertical component of distance between the front ends of the upper and lower links. The seat part may be located forward, even with, or rearward of the vertically extending portion of the base part in different embodiments. In each instance, a back part is preferably connected to the seat part in such a manner that the back part maintains a constant angle of reclination.

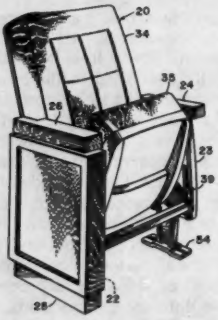
3,567,280
RECLINER CHAIR OR SIMILAR ARTICLE OF FURNITURE
Bruce E. Bradshaw, Ellicott, N.Y., assignor to Jamestown Lounge Company, Jamestown, N.Y.
Filed Oct. 16, 1968, Ser. No. 768,057
Int. Cl. A47c *1/032*
U.S. Cl. 297—318 **19 Claims**

Lounge-type recliner chair having fully upholstered back and seat hingedly connected together and mounted for limited slidable movement as a recliner unit on a wholly independently upholstered main chair frame which includes a fixed seat frame and a high, fully upholstered wing-back. Slidable seat portion of the recliner unit rides on arcuately-shaped matched maple slider elements of the fixed seat frame, and the slidable back portion of the recliner unit has a rearwardly projecting pair of slide follower elements which ride on respectively associated back slide elements which are in direct rearward alignment with the former. See specification for different seat slider and back slider arrangements, all of which provide that

the seat slider elements project downwardly, and the back slider elements project only rearwardly, there being no laterally projecting connections between the recliner unit and the fixed chair frame.



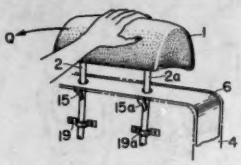
3,567,281
LOUNGER CHAIR
Chester J. Barecki, Grand Rapids, and Kenneth W. Hozeski, Grandville, Mich., assignors to American Seating Company, Grand Rapids, Mich.
Filed Apr. 28, 1969, Ser. No. 819,668
Int. Cl. A47c *1/12*
U.S. Cl. 297—333 **5 Claims**



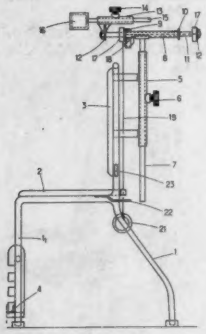
A chair unit wherein a torsion bar is provided adjacent the lower front to always return the chain to an upright position, thereby eliminating springs at the rear of the chair unit which would be in the way of the occupant behind.

3,567,282
VEHICLE SEAT ADJUSTABLE HEAD REST
Seizho Ohta, Toyota-shi, and Motokuni Kage, Aichi-ken, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-cho, Toyota-shi, Aichi-ken, Japan
Filed Oct. 2, 1968, Ser. No. 764,487
Claims priority, application Japan, Oct. 4, 1967, 42/84,014
Int. Cl. A47c *7/36, 7/42*
U.S. Cl. 297—410 **3 Claims**

An adjustable head rest for a vehicle seat is formed by a support rod fitted at its upper end into a head rest member and at its lower end into the frame of the vehicle seat. Means are adjustably positionable on the supporting rod for varying the height of the head rest above seat. For such adjustable positioning, recesses are formed along one side of the supporting rod. A retaining member, secured to the vehicle seat, has an edge engageable with one of the recesses and a biasing strip for acting on the opposite side of the supporting rod to bring one of the recesses into engagement with the edge. A guide member for guiding the supporting rod in its longitudinal direction has an edge serving as a bearing point for the supporting rod to be swung against the biasing force of the biasing strip.



3,567,283
APPARATUS FOR CERVICO-DORSAL RE-EDUCATION IN SITTING POSITION
Charles Hebert, 15 Place d'Allier, Moulins, France
Filed Nov. 15, 1968, Ser. No. 776,064
Claims priority, application France, Dec. 1, 1967, 130,520
Int. Cl. A47c *7/36, 7/42*; A61h *1/02*
U.S. Cl. 297—410 **9 Claims**

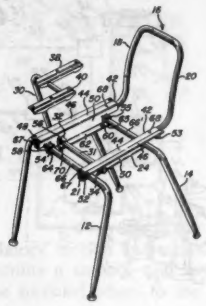


Apparatus for cervico-dorsal re-education in sitting position including a tubular chair fitted with a bottom and a back at right angle in which the back is equipped with a mobile alternate side travel device sliding in a plane perpendicular to the back, said device under the stress of a weight working positively so as to enable the patient to operate said device, with the assistance of a head-holder, according to a double-acting dynamic effect.

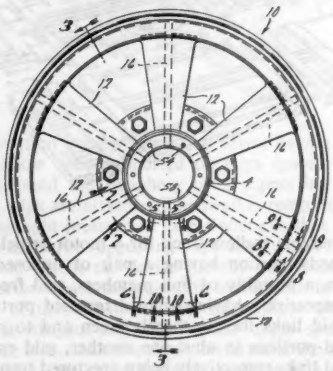
3,567,284
CHAIR ASSEMBLY
William C. Miller, New Castle, and Dick E. Shoemaker and Gordon C. Lambert, North Manchester, Ind., assignors to American Standard Inc.
Filed Nov. 14, 1968, Ser. No. 775,622
Int. Cl. A47c *7/02*
U.S. Cl. 297—451 **5 Claims**

A chair has a pair of spaced parallel aligned Z-shaped brackets formed for receiving the horizontal portions of a pair of inverted U-shaped leg members in slots at either end of the center section of the brackets and receiving the support arm of a tablet table through an aperture in

each center section, and provided with a number of integral tabs which are bent over the lower surface of the back brace tubes and a number of tabs which are bent over the upper surface of the leg members for holding these members in position by forming regions for welding. The back brace tubes extend the full length of the bracket and are received above the horizontal leg members. A seat rests on both brackets and is formed with an overlying front edge which conceals the forward ends of the back brace tubes.

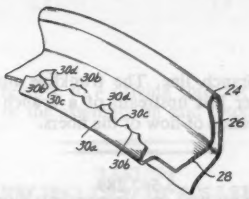


3,567,285
SIMULATED MAGNESIUM BICYCLE WHEEL AND METHOD
Randall D. Faurot, South Bend, Ind., assignor to Sheller-Globe Corporation, Detroit, Mich.
Filed Feb. 10, 1969, Ser. No. 797,792
Int. Cl. B60f *7/00*
U.S. Cl. 301—37 **4 Claims**



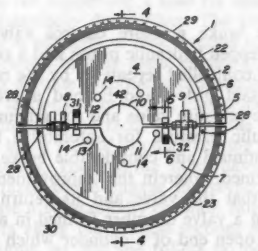
A simulated magnesium bicycle wheel comprised of a hub which may be adapted for fitting with numerous alternative conventional bicycle axles or gear hubs, a plurality of spokes with their ends connected to the hub, rim means connected to the other ends of the spokes for mounting a rubber tire, at least two simulated magnesium plastic covers fitted around the spokes and surrounding both sides thereof, means for attaching said plastic covers together around the bicycle wheel to thereby provide the wheel when viewed from either side thereof with the appearance of magnesium, said covers being made of at least one plastic material selected from the group of high impact polystyrene, acrylonitrile butadiene styrene, polypropylene, polyethylene, vinyl, cellulose acetate butyrate, or cellulose acetate propionate, with said covers being formed by injection molding; and, the method of preparing and using said simulated magnesium bicycle wheel.

3,567,286
WHEEL COVER
Frederic T. Gibbings, Bloomfield Hills, Mich., assignor to North American Rockwell Corporation, Philadelphia, Pa.
Filed Jan. 14, 1969, Ser. No. 791,004
Int. Cl. B60b *7/02*
U.S. Cl. 301—37 **4 Claims**



An automotive wheel cover having spring fingers projecting generally axially from a continuous generally cylindrical flange, with outwardly bent terminal portions on the fingers terminating in scalloped edges formed by arcuate indentations intersecting in sharp spurs adapted to bite into a generally cylindrical flange on the wheel rim and resist both withdrawal and turning of the wheel cover relative to the rim.

3,567,287
WHEEL AND TIRE ASSEMBLIES
Fayette A. Nutter, 704 E. 5th St., Canton, S. Dak. 57013
Filed Oct. 9, 1968, Ser. No. 766,119
Int. Cl. B60b *19/00*
U.S. Cl. 301—38 **2 Claims**

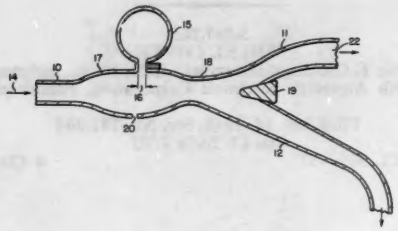


A foldable wheel and tire assembly for vehicles.

3,567,288
PNEUMATIC FIBER CONVEYING SYSTEM
Dennis E. Wood, Penfield, N.Y., assignor to Curlator Corporation, East Rochester, N.Y.
Filed Feb. 3, 1969, Ser. No. 796,070
Int. Cl. B65g *53/04*
U.S. Cl. 302—28 **16 Claims**

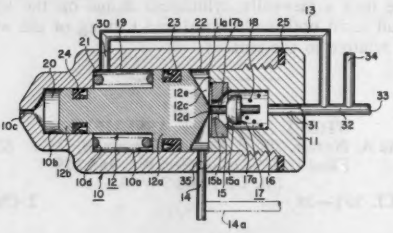
An air jet is used to divert fibers and air from a trunkline into a branch line to feed the fibers to a card or a machine for forming random fiber webs, etc. The branch line may carry the air and fibers through a trumpet section to a moving foraminous condenser on which the fibers will be deposited while the air is sucked by a fan

through the condenser and returned to the trunkline to form the air jet. Thus, the amount of fibers at any one time in the trumpet section will control the supply of



fibers to the branch line. The trunkline may be of increased diameter just upstream of a branch line to help control the direction of flow of the fibers.

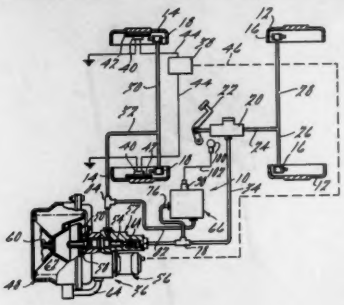
3,567,289
HYDRAULIC BRAKE PRESSURE CONTROL VALVE ASSEMBLY
Tsuneo Kawabe, % Aisin Seiki Company Limited, 1, 2-chome, Asahi-machi, Kariya-shi, Aichi-ken, Japan
Filed May 20, 1969, Ser. No. 826,118
Claims priority, application Japan, May 25, 1968, 43/35,591
Int. Cl. B60t *8/26*
U.S. Cl. 303—6 **7 Claims**



A hydraulic brake pressure control valve assembly comprising a stepped hydraulic piston and a control valve which is on-off controlled repeatedly by the reciprocating movement of said piston and beyond a predetermined hydraulic brake pressure value and for gradually increasing the hydraulic pressure for automotive rear wheels so far as a continued and considerable brake application is being performed, wherein the improvement resides in such a point that the valve and its return spring are mounted within a valve chamber formed in a plug member closing an open end of a cylinder which houses slidably said piston, the latter being arranged and mounted axially in opposition to said valve and its return spring, for making main working parts, especially said piston, easier to manufacture and assemble, in addition to make the whole control valve assembly in a highly compact and simple design.

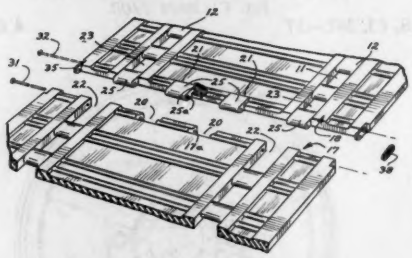
3,567,290
FAILURE INDICATING DEVICE FOR SKID CONTROL SYSTEM
John V. Liggett, Westland, and Frank L. Moncher, Farmington, Mich., assignors to Kelsey-Hayes Company, Romulus, Mich.
Filed Dec. 9, 1968, Ser. No. 782,388
Int. Cl. B60t *8/06, 17/22*
U.S. Cl. 303—21 **9 Claims**

In a skid control system for controlling the fluid pressure applied to the brakes of at least one wheel of a wheeled vehicle from a source of brake actuating fluid and comprising modulating means having fluid inlet and outlet portions for controlling the magnitude of the brake actuating fluid supply to the brakes, the improvement comprising sensing means for sensing the differential pressure



conditions between the fluid inlet and outlet portions of the modulating means, and indicating means providing a signal for the vehicle operator to indicate actuation of the sensing means.

3,567,291
ENDLESS TRACK CONNECTING STRUCTURE
William W. Paulson, Braham, Minn., assignor to Dahlman Manufacturing & Sales, Inc., Braham, Minn.
Filed Apr. 21, 1969, Ser. No. 817,884
Int. Cl. B62d *55/24*
U.S. Cl. 305—37 **2 Claims**

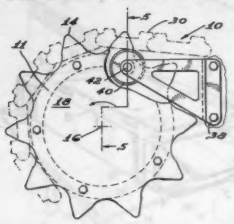


A separable endless track for a motor vehicle comprising a body portion having a pair of opposed free end portions, a plurality of link members, said free end portions respectively having aligned recessed portions to receive said links therein therebetween and to permit said free end portions to abut one another, said end portions and said links respectively being apertured transversely of said track to receive rods therethrough to join said end portions by means of said links and said links conforming in thickness to said recessed portions.

3,567,292
SPROCKET ENGAGEMENT SUPPORT WHEEL FOR AN ENDLESS TRACK
Richard T. Amsden, Oakland, Mich., assignor to the United States of America as represented by the Secretary of the Army
Filed Feb. 19, 1969, Ser. No. 800,422
Int. Cl. B62d *55/12*
U.S. Cl. 305—57 **2 Claims**

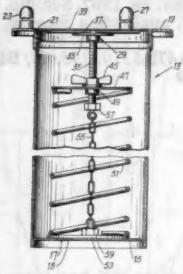
A sprocket engagement support wheel mounted adjacent a sprocket wheel which is utilized to drive an endless track. The sprocket engagement support wheel comprises

a roller, the diameter of which is small compared to the diameter of the sprocket wheel. The roller is preferably externally coated with an elastomer. The roller functions



to eliminate oscillatory motion and vibration in the endless track and permits a smooth and even transmission of power from the sprocket wheel to the track.

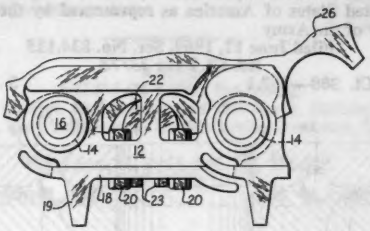
3,567,293
DISPENSING DEVICE
Arthur Salcman, Old Saybrook, Conn., assignor to American Machine & Foundry Company
Filed May 16, 1968, Ser. No. 729,782
Int. Cl. A47f *1/00*; B65g *1/16, 11/00*
U.S. Cl. 312—71 **4 Claims**



This invention is for a dispensing device having a freely resting shallow head supported on clips spaced at 120° intervals around the periphery of a supporting disk to which the clips are attached. The head is removed simply by applying light pressure to its periphery so that it pivots on two of the three supporting clips after which it can be simply lifted out of the device thereby permitting access to the interior where the adjusting mechanism is located. Adjusting of the dispensing rate takes place simply by loosening a wingnut and rotating the upper spring supporting disk in a clockwise direction to raise the disk and the dispensing rate on a threaded stud or in a counterclockwise direction to lower the dispensing rate. The dispenser of this invention also features a simplified centralizing and locking mechanism.

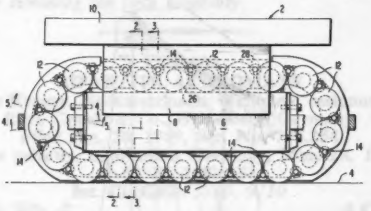
3,567,294
ARTICULATED CHAIN ASSEMBLY
Fred E. Simpson, Washington, and Eugene J. Hnilicka, Peoria, Ill., Roy E. Mayo, Santa Barbara, Calif., and John S. Ricca, Jr., Bartonville, and Gail G. Avery and Charles E. Wagaman, Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Sept. 20, 1967, Ser. No. 669,218
Int. Cl. B62d *55/20*
U.S. Cl. 305—57 **13 Claims**

Improved articulated chain assembly for a track-type vehicle wherein mid-pitch driving lugs are located on the assembly substantially equidistant the centers of the articulated joints, and wherein said lugs have a geometric



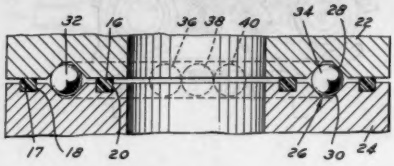
relationship relative to a driving sprocket to permit limited rocking of the assembly on said sprocket.

3,567,295
LINEAR RECIRCULATING ROLLER BEARING
Donald F. Wilkes, Albuquerque, N. Mex., assignor to Rolamite Technology, Incorporated, San Francisco, Calif.
Filed Sept. 24, 1968, Ser. No. 762,013
Int. Cl. F16c *29/06*
U.S. Cl. 308—6 **21 Claims**



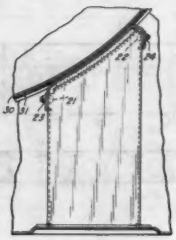
A bearing for supporting a load for relative movement along a substantially flat surface. The load is supported by means of a plurality of load bearing rollers which are mounted between bearing races having a pair of straight sections and arcuate sections interconnecting the ends of the straight sections to provide a closed loop. Spacer rollers are mounted in the races between the bearing rollers. Each roller has a pair of circular bearing surfaces of different diameters. The bearing races have corresponding bearing surfaces which engage the respective roller surfaces to cause a substantially constant rate of progression of the rollers along the straight sections and through the arcuate sections, so that the rollers do not slide relative to the bearing surfaces or relative to each other. The path of the central axis of the spacer rollers is at a greater distance from the center of curvature of each arcuate section than the load rollers. The circular roller surfaces and the bearing surfaces of each arcuate section cause the velocity of the central axis of the load rollers to be less than along the straight sections, while the velocity of the central axis of the spacer rollers is greater than along the straight sections. This is accomplished without changing the speed of rotation of the respective rollers. The bearing also includes an adjustment for varying the effective length of the bearing races in order to impose an initial load between the rollers and the bearing surfaces and thereby to prevent sliding around the entire loop. The rollers are maintained in alignment as they progress around the bearing races by opposed guide surfaces that engage conical surfaces on the rollers adjacent the circular bearing surfaces.

3,567,296
SEAL MATERIAL FOR DYNAMIC APPLICATION
Anthony J. Suchocki, Rochester, Mich., assignor to the United States of America as represented by the Secretary of the Army
Filed June 17, 1969, Ser. No. 834,115
Int. Cl. F16c *33/78*
U.S. Cl. 308—187.1 3 Claims



A seal comprising a flexible rod of a polyethylene foam material is disclosed.

3,567,297
BEARING SURFACES WITH IMPROVED LUBRICATING CHARACTERISTICS
Robert D. Triplett and Terry J. Laue, Effingham, Ill., assignors to Fedders Corporation, Edison, N.J.
Filed May 15, 1969, Ser. No. 825,000
Int. Cl. B44c *1/04*; F16c *27/00*
U.S. Cl. 308—238 18 Claims



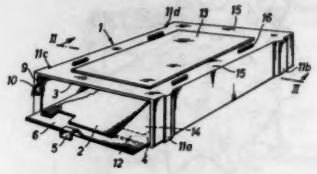
A first mating bearing surface is prepared as a pad combining carbon, preferably graphite, with a lubricating synthetic polymer. The opposing bearing surface is coated with a resinous paint so cured as to have a multitude of vortex cells. As the bearing surfaces run against each other, the carbon-lubricating synthetic polymer mixture is transferred, in part, to the vortex structure of the mating surface so as to provide a physically bonded lubricant, of the same composition, which bears against the first surface from which the lubricant was transferred.

ERRATUM

For Class 312—71 see:
Patent No. 3,567,293

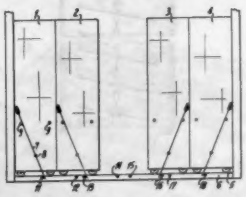
3,567,298
STACKABLE BOX-LIKE CONTAINERS
Antonius J. J. Ambaum, Kenzenstr. 16, Steyl, Netherlands; and Peter A. M. Ambaum, Gouv. V. Hovellaan 30; and Wilhelmus J. C. Ambaum, Oude Schans 46, both of Reuver, Netherlands
Filed Oct. 14, 1968, Ser. No. 767,294
Claims priority, application Germany, Oct. 13, 1967, N 20,684
Int. Cl. F16b *12/00*
U.S. Cl. 312—111 1 Claim

A container for the storage of documents and the like is described wherein wedge-shaped grooves are provided on each of the longitudinal sides for interconnecting two or more horizontally disposed containers. The grooves face outwardly on one side and inwardly on the opposite side of each container. A raised flat portion and longitudinal



humps disposed on the top of the container fit into corresponding reliefs in the bottom of a second container vertically superimposed on the bottom container. A flap may be used to cover the front opening, and an insert can be provided for carrying documents.

3,567,299
MANUALLY SHIFTABLE RAIL MOUNTED SHELF UNITS
Harald O. Lundqvist, 25 Route de Malagnou, Geneva, Switzerland
Filed Nov. 20, 1967, Ser. No. 684,402
Claims priority, application Sweden, Nov. 28, 1966, 16,233/66
Int. Cl. A47b *53/02*, *96/00*; B61d *15/10*
U.S. Cl. 312—199 6 Claims

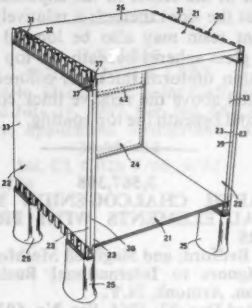


Shelving units are movable along guide rails between selected end portions by means of a lever swingably mounted on a side of each unit and having a lower end portion engageable with selected, variably positionable abutments projecting laterally from one of the rails and an upper end portion providing a hand grip for swinging the lever about its pivot to move the unit by a leverage action. The pivot point of the lever is adjustable along the lever to provide variable leverage.

3,567,300
SHELF STRUCTURE COMPRISING A PLURALITY OF MUTUALLY MESHING ELEMENTS
Enzo Mari, P.zale Baracca 10, Milan, Italy
Filed Dec. 19, 1968, Ser. No. 785,305
Claims priority, application Italy, Dec. 30, 1967, 24,591/67
Int. Cl. A47b *47/04*; A47f *5/00*
U.S. Cl. 312—257 8 Claims

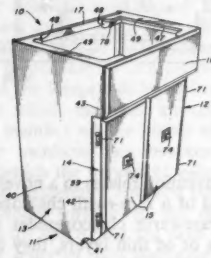
A shelf structure is provided, which can be assembled starting from a number of prefabricated component parts so as to make up a parallelepipedal body. All the component parts are mutually engaged by frictional forces developed in a number of rib-groove and/or mortise tenon

joints. The constructional arrangement disclosed herein lends itself well to manufacturing the several component



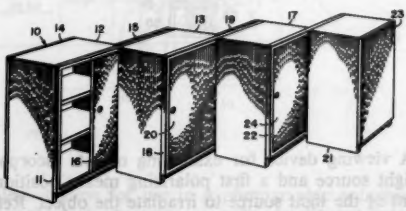
parts with a plastic material, preferably by injection moulding.

3,567,301
DEMOUNTABLE CABINET
Donald M. Dary, 11732 Holly St., Colton, Calif. 92324
Filed Aug. 14, 1969, Ser. No. 850,195
Int. Cl. A47b *43/0, 47/00*
U.S. Cl. 312—257 **6 Claims**



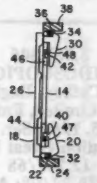
A box-like base, right and left cabinet sides with forwardly stepped front edges, an upper front panel, a pair of doors hingedly mounted on a front door frame, a rear upper side spacer, said sides shiftably interlocking transversely with said base, said panel, door frame and spacer interlocking in a fore and aft direction with said sides, and internally hidden manually applied fasteners rigidly fixing said cabinet parts in said interlocked relationships.

3,567,302
SLIDING DOOR CABINET CONSTRUCTION
Arthur W. Carlson, Muskegon, Mich., assignor to E. H. Sheldon & Company, Muskegon, Mich.
Filed May 7, 1969, Ser. No. 822,437
Int. Cl. A47b *17/00, 47/00*
U.S. Cl. 312—295 **6 Claims**



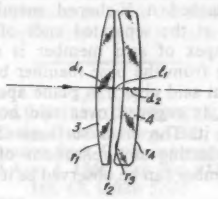
A sliding door cabinet construction wherein a uniquely constructed channel-shaped frame is attached to the cabinet adjacent the open front and which slidingly supports a closure door, the frame extending beyond one end side of the cabinet to provide stabilization and afford utilization as by another cabinet.

3,567,303
SELF-LOCKING HANDLE
Joseph C. Fox, Richardson, and William B. Stuhler, Garland, Tex., assignors to Collins Radio Company, Dallas, Tex.
Filed Jan. 21, 1969, Ser. No. 792,592
Int. Cl. A47b *95/02*
U.S. Cl. 312—320 **3 Claims**



A flexible self-locking handle for mounting panels or the like to a rack assembly. The handle end portions include means for lockably engaging said rack. By flexing said handle, the end portions are translated inwardly thereby releasing the rack assembly.

3,567,304
BIPARTITE ACHROMATE
Hans Kruger, Neckarsteinach, Germany, assignor to Eltro GmbH & Co., Heidelberg, Germany
Filed Jan. 30, 1969, Ser. No. 795,254
Claims priority, application Germany, Mar. 13, 1968, P 12 81 168.6–51
Int. Cl. G02b *3/00, 9/10*
U.S. Cl. 350—2 **4 Claims**



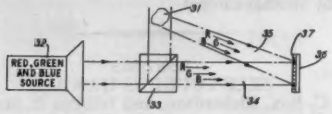
A bipartite achromate including a collective lens of barium fluoride and a divergent lens of sapphire or magnesium oxide, the Abbe number of the collective lens being higher than that of the divergent lens and the index of refraction being lower.

The Abbe number is a function of the refraction indices of the optical materials to be used for the individual lenses.

3,567,305
HOLOGRAM MASKING TECHNIQUES
Robert J. Collier, New Providence, Lawrence H. Lin, Plainfield, and Keith S. Pennington, Basking Ridge, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.
Filed Oct. 18, 1966, Ser. No. 587,606
Int. Cl. G02b *27/00*
U.S. Cl. 350—3.5 **29 Claims**

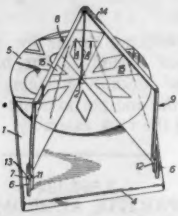
Methods and apparatus are disclosed for increasing the hologram storage capacity of a recording medium.

With the aid of various masking techniques, each hologram is stored in a large group of small areas or volumes



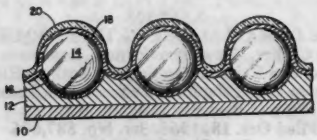
dispersed throughout the recording medium; and at least some holograms are stored in different groups.

3,567,306
KALEIDOSCOPIC TOY
Jakob Richard Spear, Cuffley, England, assignor to J. W. Spear & Sons Limited, Enfield, England
Filed Nov. 25, 1968, Ser. No. 778,718
Claims priority, application Great Britain, Mar. 18, 1968, 12,767/68
Int. Cl. G02b *27/08*; A68h *33/22*
U.S. Cl. 350—4 **5 Claims**



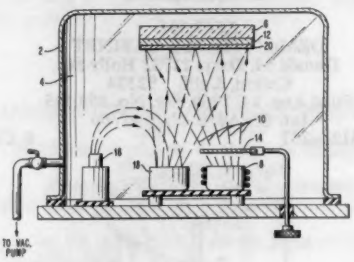
A toy using the principle of the kaleidoscope in which, in its preferred form, there is a base member to which is pivotally attached a V-shaped member, the pivots being arranged at the separated ends of said V-shaped member. The apex of said member is supported on a boss upstanding from the base member but can be lifted up from it about said pivots. A plane apertured member, suitably a disc, is engaged over said boss so that it is rotatable about it. The inner surfaces of said V-shaped member are reflecting and reflections of different parts of the plane member can be observed as it is rotated about the boss.

3,567,307
REFLECTIVE MARKERS
Donald C. Rideout and Luke M. Shuler, Huntingdon, and William H. Riley, Jr., Altoona, Pa., assignors to Prismo Universal Corporation, Huntingdon, Pa.
Original application Dec. 2, 1966, Ser. No. 598,717, now Patent No. 3,496,006, dated Feb. 17, 1970. Divided and this application Oct. 8, 1969, Ser. No. 870,979
Int. Cl. G02b *5/12*
U.S. Cl. 350—105 **5 Claims**



A reflective marker which includes small glass spheres partially embedded in a pigmented binder having a top coating of transparent resin covering the marker which covers the exposed portion of each sphere with a coating that is thicker at the center of the exposed portion of the sphere than at the sides thereof; a relatively thick coating of transparent resin may also be located in the valleys between the glass spheres beneath the top coating; and a transparent thin uniform thickness colored resin coating may be located above the relative thick coating of transparent resin and beneath the top coating.

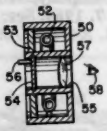
3,567,308
RARE-EARTH CHALCOGENIDE MAGNETO-OPTICAL ELEMENTS WITH PROTECTIVE LAYERS
Kie Y. Ahn, Bedford, and Siegfried Methfessel, Montrose, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 22, 1966, Ser. No. 603,933
Int. Cl. G02f *1/22*
U.S. Cl. 350—151 **5 Claims**



The present invention relates to a novel magneto-optical device composed of a rare-earth chalcogenide.

When such rare-earth chalcogenides are made in the form of crystals or of thin layers, they are subject to deterioration by exposure to the atmosphere. The use of a thin overlying protective layer having optical and magnetic properties compatible with the underlying rare-earth chalcogenide is highly desirable. In one example, Eu_2O_3 is employed as the protective layer for EuO.

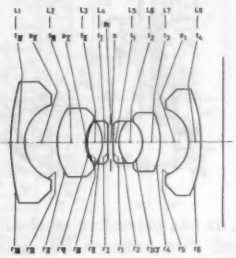
3,567,309
GLARELESS LIGHT VIEWING DEVICES
Joseph Jasgur, 700 N. Fairfax Ave., Hollywood, Calif. 90046
Continuation of application Ser. No. 527,663, Feb. 16, 1966. This application Sept. 17, 1969, Ser. No. 866,415
Int. Cl. G02b *27/28*
U.S. Cl. 350—156 **2 Claims**



A viewing device for examining objects incorporating a light source and a first polarizing means positioned in front of the light source to irradiate the object. Reflected light from the object in turn passes back through a second polarizing means positioned in line with a viewing opening and effecting polarization in a direction different

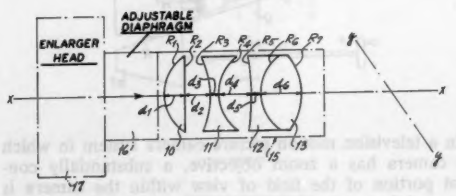
from the first polarizing means. The difference in polarization is 90°, controlling glare and highlighting the object being examined.

3,567,310
WIDE ANGLE LENS
Ludwig Bertele, Heerbrugg, Saint Gall, Switzerland
Filed July 31, 1967, Ser. No. 657,374
Claims priority, application Switzerland, Aug. 2, 1966, 11,226/66
Int. Cl. G02b *9/60, 9/62*
U.S. Cl. 350—176 **9 Claims**



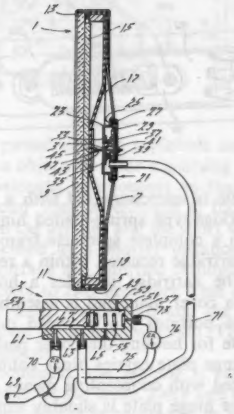
A wide angle objective lens having at least five lens members separated by air spaces, of which two converging lens members, separated by a diaphragm space, are followed on the object side by at least two diverging lens members, and on the image side by at least one diverging lens member, in which the axial air space between the converging lens member on the object side and the preceded diverging meniscus lies between 0.002 F and 0.050 F, and in which the numerical value of the product of the ratio of the difference between the radii of curvature of the bounding surfaces of the said air space to the length of the air space, and the ratio of the radius of curvature of the inner of said bounding surfaces to the radius of curvature of the convex surface of the pair of surfaces concave towards the diaphragm in the converging lens member on the image side, lies between 1.60 and 3.9.

3,567,311
LENS SYSTEM HAVING SELECTIVELY CONTROLLABLE SPHERICAL ABERRATION
William Terzian, 25 Buckingham Place, Manhasset, N.Y. 10030
Continuation-in-part of application Ser. No. 685,655, Nov. 24, 1967. This application Nov. 20, 1969, Ser. No. 878,419
Int. Cl. G02b *9/14, 13/20*
U.S. Cl. 350—188 **2 Claims**



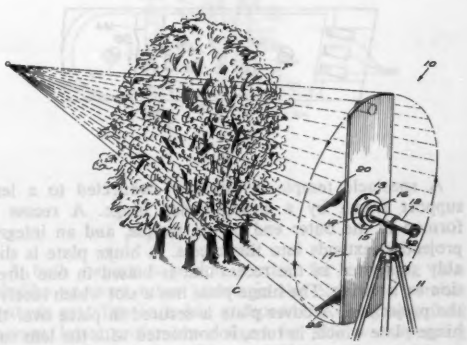
A lens system for use in a photographic enlarger, in which spherical aberration can be introduced into an image format and in which said aberration can be selectively controlled. The paraxial region of the image format is in focus, and defocusing can be applied in a non-linear manner in an area surrounding the paraxial region. A plurality of lenses are employed having specific and relative focus lengths, radii of curvature, axial thickness, and axial air space between the lenses, and also of particular refractive index and dispersive index.

3,567,312
DAY-NIGHT MIRROR ACTUATION APPARATUS
George E. Platzer, Jr., Southfield, Mich., assignor to Chrysler Corporation, Highland Park, Mich.
Filed Nov. 1, 1968, Ser. No. 772,611
Int. Cl. G02b *5/08*
U.S. Cl. 350—280 **6 Claims**



Mirror actuating apparatus including a fluid immersed mirror, a pressure operated mechanism for moving the mirror, and a control mechanism for energizing the pressure operated mechanism to move the mirror to one of two positions when the vehicle engine is started.

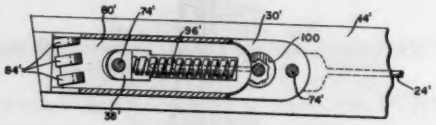
3,567,313
OPTICAL FOLIAGE PENETRATOR
Dwin R. Craig, Gaithersburg, Md., assignor to Ingenuics, Inc., Gaithersburg, Md.
Filed Apr. 4, 1969, Ser. No. 813,415
Int. Cl. G02b *5/08*
U.S. Cl. 350—299 **6 Claims**



A device for permitting optical penetration of foliage by constantly changing the line of sight through the foliage

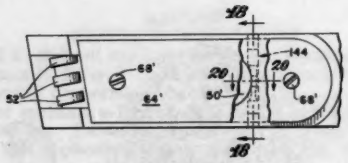
so as to utilize the limited open areas existing in foliage to provide an optical sight path. Mechanically, the device includes a central viewing tube and a pair of mirrors arranged so that the outer mirror can rotate in a relatively wide circle.

3,567,314
CARTRIDGE-TYPE SPRING-LOADED HINGE FOR SPECTACLE FRAMES
Frederick Speer, 131 Briar Hill Circle, Springfield, N.J. 07081
Filed June 2, 1969, Ser. No. 829,657
Int. Cl. G02c *5/16, 5/20*
U.S. Cl. 351—113 **3 Claims**



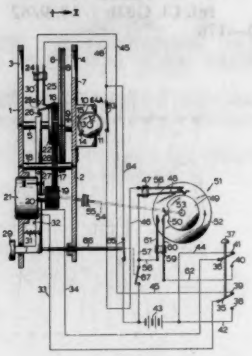
A temple is interconnected with a lens support frame by a cartridge-type spring-loaded hinge, there being two temples in a complete spectacle frame. Each hinge comprises a cartridge received within a recess in the end of a temple. The cartridge includes a housing formed of a base and a cover plate and is assembled as a unit. Interengageable portions are provided on the base and the cover plate for holding the cover plate in operative position. A hinge plate carries hinge connecting means which is connected with cooperating means on the lens support frame. The hinge plate is slidably supported by the housing of the cartridge, and a spring within the cartridge normally biases the hinge plate in one direction. Means is also provided for selectively prestressing the spring.

3,567,315
SPRING-LOADED HINGE FOR SPECTACLE FRAMES AND SYSTEM FOR ADJUSTMENT OF TEMPLE ANGULATION
Frederick Speer, 131 Briar Hill Circle, Springfield Township, Union County, N.J. 07081
Filed June 2, 1969, Ser. No. 829,658
Int. Cl. G02c *5/16, 5/20*
U.S. Cl. 351—113 **5 Claims**



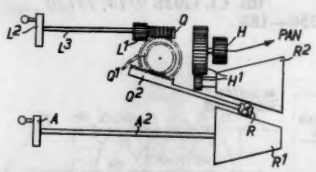
A spectacle temple is pivotally connected to a lens support frame by a spring-loaded hinge. A recess is formed in the outer end of the temple, and an integral projection extends into this recess. A hinge plate is slidably supported in the recess and is biased in one direction by a spring. The hinge plate has a slot which receives the projection. A cover plate is secured in place over the hinge plate which, in turn, is connected with the lens support frame. In certain forms of the invention, adjustment means is provided for selectively prestressing the spring and thereby varying the normal angulation of the temple with respect to the lens support frame.

3,567,316
MOTION PICTURE CAMERA
Theo Wilharm, Geradstetten-Hebsack, Germany, assignor to Robert Bosch Elektronik und Photokino G.m.b.H., Stuttgart-Unterturkheim, Germany
Filed Aug. 4, 1969, Ser. No. 847,006
Claims priority, application Germany, Aug. 6, 1968, P 17 97 031.9
Int. Cl. G03b *1/62, 21/36*
U.S. Cl. 352—91 **10 Claims**



A motion picture camera wherein the shutter is driven by an electric motor which is started in response to depression of a pushbutton and continues to drive the shutter on release of the pushbutton until the shutter assumes its closed position. The motor circuit includes a disconnecting switch which is closed by the pushbutton and opens only on release of the pushbutton and upon completed rotation of the shutter to its closed position. One or more arresting switches in the motor circuit can be opened independently of the pushbutton to automatically arrest the motor but only when the shutter assumes its closed position. This is achieved by the provision of a control switch which bypasses the arresting switches and is closed on release of the pushbutton to thus complete the motor circuit until the disconnecting switch opens.

3,567,317
CAMERA SYSTEMS
Dexter Robert Plummer, Leicester, England, assignor to The Rank Organisation Limited, London, England
Filed May 17, 1968, Ser. No. 729,976
Claims priority, application Great Britain, May 18, 1967, 23,252/67
Int. Cl. G03b *3/10*
U.S. Cl. 352—139 **19 Claims**

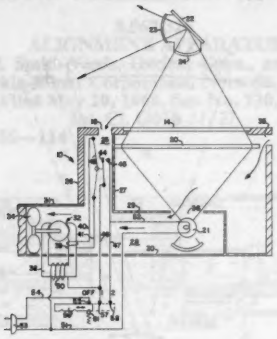


In a television motion picture camera system in which the camera has a zoom objective, a substantially constant portion of the field of view within the camera is traversed for a given demand from a demand unit, during angular movement of the camera, irrespective of the magnification of the camera-objective combination. This is achieved by making the angular drive of the camera variable and sensitive to the magnification of the camera-objective combination.

3,567,318
LAMP ACTUATING MEANS FOR AN OVERHEAD PROJECTOR

Albert E. Webb, Glenview, Ill., assignor to GAF Corporation, New York, N.Y.

Filed June 17, 1968, Ser. No. 737,650
Int. Cl. G03b *21/20*
U.S. Cl. 353—85 7 Claims

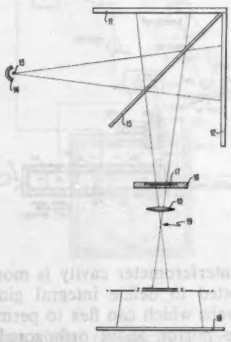


The projector includes a chamber and an air inlet opening communicating this chamber with the face of the platen. The inlet opening is arranged to be covered and substantially closed by the transparency member when the latter is placed into operative position on the projector. A fan draws air into the chamber through the inlet opening. In one embodiment, a heat sensitive relay is mounted in the chamber, such relay being adapted to actuate the lamp switch. A reduction in the air flow into said chamber resulting from placement of the transparency member into operative position causes an increase in the temperature in the chamber thereby to actuate the relay and close the switch in the lamp circuit. In another embodiment, a diaphragm is mounted in said chamber and associated with the lamp switch. A reduction in the pressure in said chamber occasioned by placement of the transparency member into operative position causes the diaphragm to expand and close the switch for energizing the lamp.

3,567,319
ILLUMINATION SYSTEM

Charles A. Gaston, Wheaton, Md., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 9, 1968, Ser. No. 766,221
Int. Cl. G03b *21/28*
U.S. Cl. 353—99 6 Claims



An illumination system for converting diverging light from a light source into converging light without the use of a lens, by utilizing a half-silvered mirror and two retroreflective surfaces.

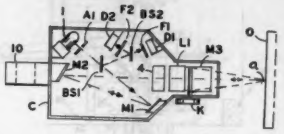
ERRATUM

For Class 355—8 see:
Patent No. 3,567,344

3,567,320
NON-CONTACT OPTICAL MEASURING PROBE

Anwar K. Chitayat, Plainview, N.Y., assignor to OPTOmechanisms, Inc., Plainview, N.Y.

Filed Dec. 23, 1968, Ser. No. 785,937
Int. Cl. G01c *3/08*
U.S. Cl. 356—4 11 Claims



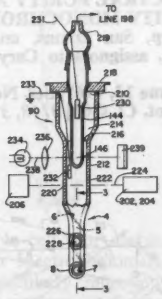
A light beam is passed through a pinhole and focused on the surface of an object. A color dispersing plate provides different wavelength components so that the illumination of one color long wavelength is focused at a greater distance than the average and the short wavelength components are focused at a shorter distance. The reflections from the surface are returned through the same lens and beam splitters to two detectors. One detector is filtered to pass the short wavelength and the other detector is filtered to pass the long wavelength. The detector outputs are then compared.

In a second embodiment, the pinhole is oscillated to change the focal length of the beam. Only one detector is used and the detector output is compared in phase with the oscillation voltage.

3,567,321
BATH FOR CONTAINING AND RECEIVING A PLURALITY OF APERTURE TUBES

Walter R. Hogg, Hialeah, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

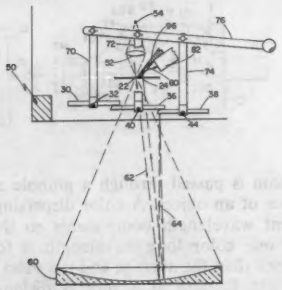
Filed July 22, 1968, Ser. No. 747,782
Int. Cl. G01n *21/26, 27/42*
U.S. Cl. 356—72 10 Claims



A bath having a pocket portion for retaining test-tubelike aperture tubes known in the electronic particle analysis art. The bath has a depending, elongated, fluid passage bore, preferably defined by side walls tracing a segment of an exponential curve. Fluid entrance and exit lines enter the passage bore near its bottom, such that fluid flow upward into the pocket chamber is smooth and without significant turbulence, squirting, or bubbling

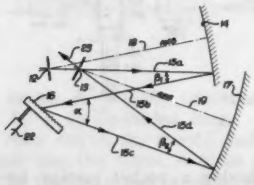
The bath, associated aperture tubes, electronic and optical detecting elements provide an improved combination useful in particle analysis.

3,567,322
SPECTROMETER
Richard Keith Brehm, Lexington, and Charly Dany Allemand, Newtonville, Mass., assignors to Fisher Scientific Company, Pittsburgh, Pa.
Filed Oct. 27, 1967, Ser. No. 678,618
Int. Cl. G01j 3/06, 3/18
U.S. Cl. 356—98 **17 Claims**



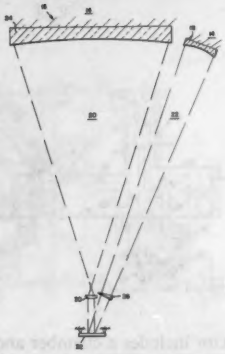
An $f/1$ spectrometer has entrance and exit slits, each ten millimeters high and fifty microns wide, which are parallel to one another and spaced three millimeters apart. A parabolic collimating mirror of thirty centimeters focal length reflects light from the entrance slit onto a dispersing mosaic of nine gratings each ruled with 1200 grooves per millimeter. The gratings are mounted on three parallel axes and a drive linkage rotates all the gratings simultaneously through equal angles. The middle grating has an aperture through which light passes between the entrance and exit slits and the collimating mirror. Behind the exit slit is mounted an elliptical reflector that has focal points spaced fifty-eight millimeters apart along an axis at an angle of 34° 40′ to the plane of the entrance-exit slit optics for concentrating light passing through the exit slit on a photomultiplier.

3,567,323
HIGH SPECTRAL PURITY AND IMAGE QUALITY MONOCHROMATOR
Vernon L. Chupp, San Dimas, and Paul C. Grantz, Pomona, Calif., assignors to Cary Instruments, Monrovia, Calif.
Filed June 13, 1967, Ser. No. 645,746
Int. Cl. G01j 3/18, 3/42
U.S. Cl. 356—99 **15 Claims**



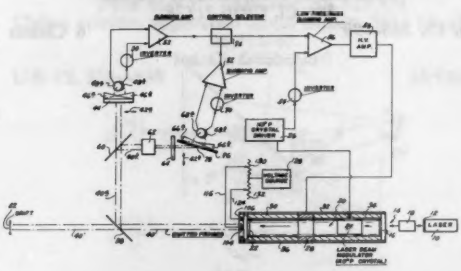
This is an improved asymmetric monochromator system, featuring coma cancellation, exceptional image quality, and invariance with wavelength of slit-image curvature. First and second paraboloidal mirrors having noncoincident axes are utilized; the reflections of the beam at the first and second mirrors are mutually asymmetric.

3,567,324
METHOD FOR MEASURING GAS TURBULENCE OVER LONG PATHS
Robert E. Brooks, Redondo Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.
Filed Jan. 16, 1968, Ser. No. 698,321
Int. Cl. G01b 9/02; G02b
U.S. Cl. 356—107 **3 Claims**



The method of this invention measures the optical phase distortions in light due to its passage through turbulent air. The measurements are made by flying an aircraft above or through the turbulence. A ground station directs a laser beam to the aircraft, whereon is mounted a pair of concave reflectors that intercept the laser light and direct it in the form of two beams, to intersect on a photographic plate. The plate is double exposed to the beams to create a differential interferogram. The plate is then developed. The interference pattern containing information about the phase distortions of the turbulent air is created by directing a beam of laser light onto the photographic plate.

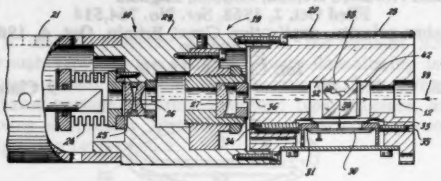
3,567,325
SYSTEM FOR STABLE POSITIONING OF INTERFEROMETER MIRRORS
Edward Camp Tibbals, Jr., Boulder, Colo., assignor to Alexander Dawson, Inc., Mahwah, N.J.
Filed Aug. 31, 1967, Ser. No. 664,664
Int. Cl. G01b 9/02; H01s 3/00
U.S. Cl. 356—112 **6 Claims**



A mirror of an interferometer cavity is mounted in a frame which is slotted to define integral gimbal rings connected by thin webs which can flex to permit angular displacement of the mirror about orthogonally related axes by applying suitably controlled voltages to piezoelectric crystals acting against the gimbal rings, whereby to angularly position the mirror in a stable manner, and the mirror mounted in such frame is positioned in the longitudinal direction of the cavity relative to the other

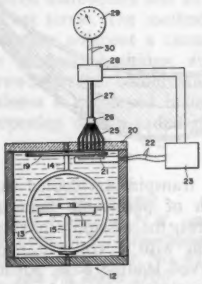
mirror defining the cavity by means of a spacer member of quartz or other piezoelectric material having a voltage applied thereto which is varied in response to the photoelectric detection of the drifting of the emitted beam from a desired location so as to return the beam to that location.

3,567,326
ALIGNMENT APPARATUS
William R. Smith-Vaniz, Darien, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.
Filed May 20, 1968, Ser. No. 730,396
Int. Cl. G01b 11/27
U.S. Cl. 356—114 13 Claims



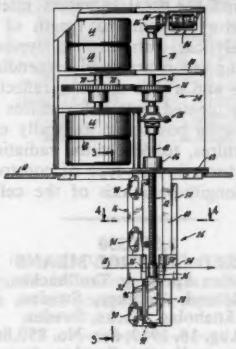
An alignment apparatus having a laser light source which provides an output beam for projection at a reflective surface remotely positioned at a target object, a locally positioned beam sensing means, and a locally positioned beam reflective means disposed in the beam path for directing a reflected beam at said sensing means includes a beam polarization means disposed between the light source and the remote reflective surface. This polarizing means is adapted for altering the relative polarization of the output and reflected beams in a manner for attenuating interference fringes at the sensing means. The light transmission efficiency of this arrangement is substantially enhanced by utilizing a reflective means having a polarizing surface adapted for transmitting light of a first polarization and reflecting light of a second orthogonal polarization.

3,567,327
MAGNETIC COMPASS DIRECTION INDICATING SYSTEM
Robert D. Gerard, Palisades, N.Y., assignor to the United States of America as represented by the Secretary of the Navy
Filed Nov. 2, 1967, Ser. No. 680,141
Int. Cl. G01b 11/26
U.S. Cl. 356—152 8 Claims



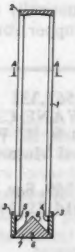
An analog signal representing the lubber line heading of a magnetic compass is obtained by projecting a narrow plane of light through an optical wedge, or a spot of light along a slit, and then converting the intensity of the planar light or the position of the spot of light into a directly read compass heading.

3,567,328
SPECIMEN TRANSPORT MOUNT FOR SPECTROPHOTOMETER
Vernon T. Riley, 2 South Road, Harrison, N.Y. 10528
Filed June 2, 1966, Ser. No. 554,909
Int. Cl. G01j 3/42; G01n 1/00
U.S. Cl. 356—244 6 Claims



Spectrophotometric analyses of specimens which have been processed by "density gradient centrifugation" can be performed by the apparatus disclosed herein without having to withdraw fractions of the material from the specimen tubes for separate analysis. The apparatus constitutes an attachment for a conventional spectrophotometer and transports the specimens in a specimen tube through the spectrophotometer's beam of light in a controlled scanning movement parallel to an established density gradient in the specimen.

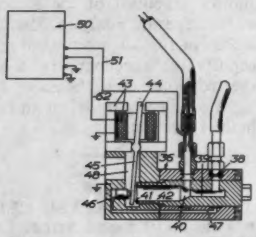
3,567,329
GAS SAMPLE ANALYSIS CELLS
Harry Arthur Willis and Edward Arthur Cudby, Welwyn Garden City, England, assignors to Perkin-Elmer Limited, Beaconsfield, England
Filed Sept. 30, 1968, Ser. No. 763,517
Claims priority, application Great Britain, Sept. 29, 1967, 44,404/67
Int. Cl. G01n 1/10, 21/06, 21/26
U.S. Cl. 356—246 9 Claims



A long gas sample cell (for use in, for example, an infra-red absorption spectrophotometer) of rectangular cross-section has specularly reflecting interior surfaces. Entrance and exit apertures are located generally at the one end of the cell; and a concave mirror at the other end of the tubular cell. The entrance and exit apertures are at least substantially at conjugate image planes relative to the converging mirror, so that radiation entering the entrance aperture (which is preferably at least near an image of the source of the spectrophotometer) is efficiently transferred through the other window. The long reflecting sidewalls of the cell act as a light pipe to increase the effective radiation flux density in the gas sample within the cell, without substantially disturbing the

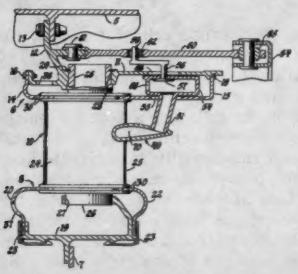
conjugate optical relationship between the apertures relative to the converging mirror. The radiation will therefore pass through the entrance aperture along the length of the cell to the converging mirror and substantially reimaged at the exit aperture, with the interior spectrally reflecting surfaces of the cell acting to "tunnel" more divergent rays and therefore both enchance the flux density within the cell and the total radiation intensity reaching the exit aperture. When the length of the sample space in the analytical instrument is typically limited, the axis of the long cell is arranged perpendicular to this sample space axis and a pair of plane reflectors (for example reflectively coated external surfaces of a right-angle prism) may be positioned, optically either before or after the apertures, to deflect the radiation (at right angles), the apertures in this type of construction being parallel to the longitudinal axis of the cell.

3,567,330
SPEED CONTROL MEANS
Ulf Martin Christian Apelskog, Trollbacken, and Lennart Erik Idoft Gidlund, Tullinge, Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden
Filed Aug. 18, 1969, Ser. No. 850,867
Claims priority, application Sweden, Aug. 27, 1968, 11,529/68
Int. Cl. F01b *25/00*; F03b *13/04*; A61c *1/10*
U.S. Cl. 415—29 **6 Claims**



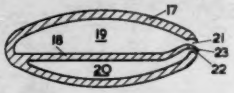
In a rotational speed control means for hand sustained pressure fluid driven grinding, drilling and like machines, preferably for dental work, an upper limit is put on the number of revolutions per minute of the machine from idling and up to full working load by a control valve and a control circuit cooperating to divert or to throttle pressure fluid in the control valve in advance of the machine such as to maintain automatically under any partial load a predetermined selective upper rotational speed limit for the machine.

3,567,331
VARIABLE VANE CASCADES
Leo A. Corrigan and Earle R. Wall, Jr., Indianapolis, Ind., assignors to General Motors Corporation, Detroit, Mich.
Filed July 25, 1969, Ser. No. 844,885
Int. Cl. F01d *25/24, 17/00*
U.S. Cl. 415—126 **7 Claims**



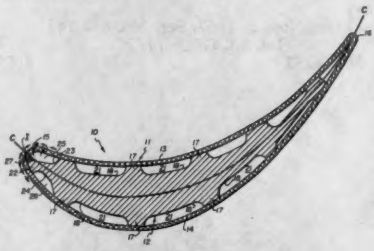
A turbine nozzle includes an annular row of radially directed blades. The area of the nozzle throat is varied by plugs which are movable with or against the direction of flow through the nozzle into the spaces between the blades. The plugs are streamlined members and may be individual members in each interblade path or may be portions of a ring extending around the nozzle axis immediately downstream of the nozzle. Provisions are made for cooling the plugs.

3,567,332
HELICOPTER ROTORS AND THE LIKE
Austin Richard Seed, Farnborough, England, assignor to Minister of Technology in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England
Filed Oct. 2, 1968, Ser. No. 764,514
Claims priority, application Great Britain, Oct. 4, 1967, 45,110/67
Int. Cl. B64c *15/10*
U.S. Cl. 416—90 **9 Claims**



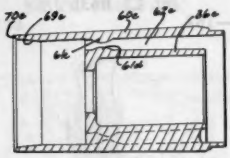
Air is discharged from two adjacent slots extending along the span of a helicopter rotor blade. The air is controlled cyclically by throttle valves disposed circumferentially about the rotor axis so that lift on the blade may be varied in accordance with its rotation, no incidence change being involved. Under certain flight conditions when the air demand is small (e.g. in hovering flight), the air flow to one of the slots is blanked off, the throttle valves being suitably profiled to effect this while still regulating flow to the other slot. Preferably the slots are of differing widths and the wider one is that which is blanked off. Three or more slots may be used if desired by suitable arrangements of air passages and valve profiles.

3,567,333
GAS TURBINE BLADE
Angelo De Feo, Totowa Boro, N.J., assignor to Curtiss-Wright Corporation
Filed Jan. 31, 1969, Ser. No. 795,424
Int. Cl. F01d *5/18*
U.S. Cl. 416—90 **1 Claim**



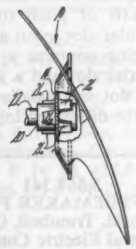
An improved transpiration cooled turbine blade comprising a sheath of permeable material surrounding a load-carrying strut, the assembly having a generally airfoil configuration with a concave and convex surface joined by a curved leading edge portion and a trailing edge portion. The strut is provided with lands and grooves with a land portion extending into abutment against the sheath to thereby reinforce the sheath against impaction of gas entrained particles. The land portion is offset from an imaginary longitudinal plane containing the camber line in a direction away from the concave surface of the blade so that cooling fluid can bleed through the sheath at the leading edge portion on both sides of the imaginary longitudinal plane.

3,567,334
FLOW-THROUGH PROPELLER
Eldon L. Lorenz, Grand Rapids, Mich., assignor to Michigan Wheel Company, Grand Rapids, Mich.
Filed Sept. 9, 1968, Ser. No. 758,524
Int. Cl. B63h 1/18, 21/26
U.S. Cl. 416—93 1 Claim



A marine propeller assembly of the exhaust flow-through type, having annular exhaust-flow-altering protrusion means extending radially into the flow through exhaust passage, creating a venturi type structure, and having a specially tapered terminal discharge portion, improving performance.

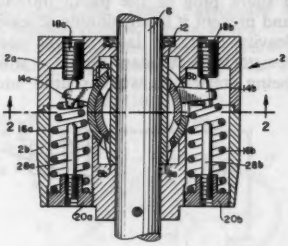
3,567,335
RESILIENT HUB ASSEMBLY AND METHOD OF MAKING SAME
Walter D. David, Torrington, Conn., and Donald F. White, Coram, N.Y., assignors to The Torrington Manufacturing Company, Torrington, Conn.
Filed June 24, 1968, Ser. No. 739,548
Int. Cl. B64c 11/04
U.S. Cl. 416—134 4 Claims



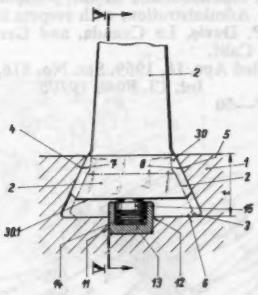
An inexpensive resilient hub assembly for fans and blowers wherein radial member defining hub opening has six integral axially bent tabs extending alternately in one and opposite axial directions. A flexible hub is compressively secured within the tabs and may have a rigid hub compressively secured therewithin and attached to a shaft by a conventional set screw. The method comprises slitting the radial member adjacent a central opening and bending the tabs to axial positions, and entering the flexible hub therewithin for compressive retention. A Teflon reducing sleeve is employed in inserting the hub into the central opening of the radial member.

3,567,336
PROPELLERS
Szabolcs Bartha, Kew Gardens, N.Y., assignor to Alexander Reti, New York, N.Y., a fractional part interest
Filed Apr. 21, 1969, Ser. No. 817,830
Int. Cl. B63h 3/00
U.S. Cl. 416—136 13 Claims

Propeller of the variable-pitch type wherein most efficient operation is ensured at all speeds of the engine drive shaft as a result of individual and direct pitch control provided for the blades associated with the drive shaft, within a predetermined maximum and minimum range. Biasing means are provided, preferably in contiguous hollow areas of two separable portions forming part of the propeller hub, for urging hub members associated with the blades into a normal rest position, and stop means for limiting the movement of the sub members at least in one extreme position wherein the blades are forced by the increasing pressure of the surrounding medium into an off-normal operated position.



3,567,337
ROTOR FOR TURBOENGINES
Ferdinand Zerlauth and Herbert Flegel, Winterthur, Switzerland, assignors to Sulzer Brothers, Ltd., Winterthur, Switzerland
Filed Nov. 27, 1968, Ser. No. 779,374
Claims priority, application Switzerland, July 26, 1968, 11,275/68
Int. Cl. F01d 5/32
U.S. Cl. 416—221 10 Claims

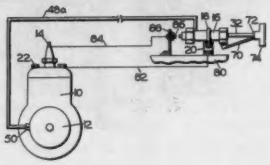


The rotor body is provided with a continuous uninterrupted slot which receives the blades in complementary locking manner. Spacers formed of individual plates space the blades and intermediary locking layers fill in the last spaces to lock the blades in place. The blades are also spring biased against the lateral surfaces of the slot.

3,567,338
AUTOMATIC PUMP SHUTOFF APPARATUS
Jack Edwards, 8217 SE. McLoughlin Blvd., Portland, Oreg. 97202
Filed Sept. 3, 1968, Ser. No. 757,027
Int. Cl. F04b 49/00; B65g 37/00
U.S. Cl. 417—34 5 Claims

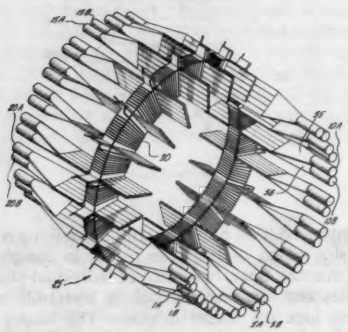
The apparatus includes a tubular housing in which a stem is slidably mounted. The stem carries a piston, and a spring is enclosed within the housing to urge the stem to a position such that one end thereof is adapted to engage and electrically ground a spark plug of a pump motor for shutting off the motor. A pressure line from

the outlet of the pump is connected into the housing, and pressure from the pump outlet is arranged to retract the piston and hold the stem away from the spark plug. When the pump pressure falls the spring causes the stem to engage the spark plug of the pump motor to shut the motor off and prevent it from running excessively without a load. Gravity operated latch means are engageable with the stem to hold the stem retracted while the pump motor is being started as well as until such time that



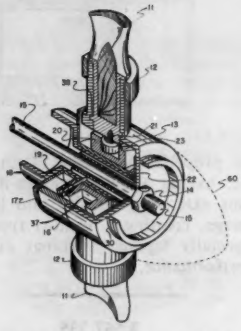
pressure builds up to hold the piston retracted, the latch being released automatically when a selected pressure has been built up. The piston has surface O-rings for sealing engagement with the interior of the housing in a rearward direction of the latter and front seals are provided for sealing in a forward direction. The shutoff apparatus of the present invention may be supported on the pump motor or if desired it may be located remotely from the pump motor and operable to electrically ground the spark plug by a connecting wire.

3,567,339
MULTIDUCTED ELECTROMAGNETIC PUMP
T. O. Paine, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Jerry P. Davis, La Canada, and Gerald M. Kikin, Pasadena, Calif.
Filed Apr. 16, 1969, Ser. No. 816,733
Int. Cl. F04b *19/00*
U.S. Cl. 417—50 **10 Claims**



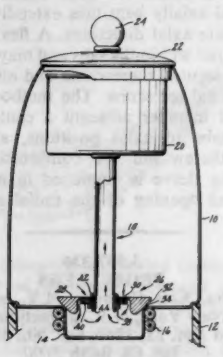
An apparatus for pumping conductive liquids is described which comprises a single toroidal electromagnetic pump structure wherein there are a plurality of pump passages with each passage having a two pump duct sandwich therein. Each pump duct has associated therewith a plural tube header assembly connected to its input and output portions. Each tube of the plural tube header assemblies is electrically insulated from adjacent tubes thereby minimizing the bypass current flow. Current flow through each twin pump duct combination is in a counter flow arrangement to minimize field distortion. The single toroidal pump structure may therefore comprise any convenient number of individual pumps formed within the compact configuration.

3,567,340
VARIABLE PITCH PROPELLER
Kurt Schneider, Maspeth, and George M. Watson, New York, N.Y., assignors to Kurt Schneider, Maspeth, and George M. Watson, New York, N.Y., fractional part interest to each
Filed May 21, 1968, Ser. No. 730,878
Int. Cl. B63h *3/04*
U.S. Cl. 416—162 **6 Claims**



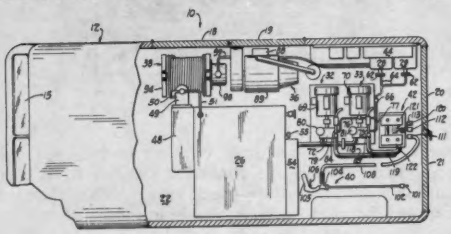
A variable pitch propeller mechanism which fits over the drive shaft of a conventional single ended power plant and permits blade adjustment adjacent to the output shaft. One end of each propeller blade contains a bearing which is offset from its axis of pitch rotation and which is coupled into an annular slot in an axially sliding bearing ring. The bearing ring contains a cam follower which tracks in both an axial slot and a spiral slot so that rotation of the spiral slot will axially displace the bearing ring so as to move the offset bearings and rotate the propeller blades.

3,567,341
COFFEEMAKER PUMP
Richard J. Ostroski, Trumbull, Conn., assignor to General Electric Company
Filed May 22, 1969, Ser. No. 826,986
Int. Cl. F04b *19/24, 1/18*
U.S. Cl. 417—209 **7 Claims**



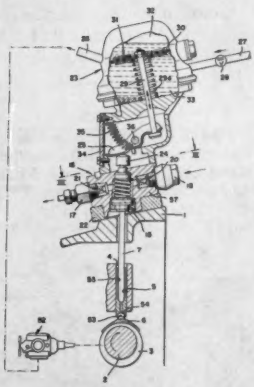
An electric percolator with improved pump tube valving wherein a conventional flexible washer that controls water admission is combined with a downward cup-shaped member having reverse flared walls for funneling boiling turbulence to produce quick perking and rapid pulsing or pumping.

3,567,342
MOBILE CLEANING UNIT
Otto V. Jackson, 600 Hemlock Road, Chagrin Falls, Ohio 44022
Original application Feb. 1, 1968, Ser. No. 702,340, now Patent No. 3,481,544, dated Dec. 2, 1969. Divided and this application Aug. 27, 1969, Ser. No. 853,354
Int. Cl. F04b *21/00*
U.S. Cl. 417—234 1 Claim



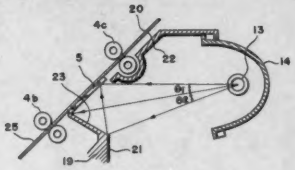
A mobile cleaning unit for providing a high pressure cleaning spray, comprising a van-type vehicle with a water storage tank, apparatus for selectively mixing liquid cleaner, and power spraying equipment. A separate power generating unit carried in the truck operates the spray. A gasoline motor for the generating unit is started from the vehicle electrical system and is supplied with fuel from the fuel system of the vehicle. The power spraying equipment is also operable from a source of electric current external to the vehicle through a reel and electric cable unit selectively connected through a control switch.

3,567,343
HYDRAULIC PUMP ARRANGEMENT FOR INTERNAL-COMBUSTION ENGINE
Hans Erdmann, Neu Isenburg, Germany, assignor to Alfred Teves G.m.b.H., Frankfurt am Main, Germany
Filed Feb. 4, 1969, Ser. No. 796,406
Claims priority, application Germany, Feb. 7, 1968, P 16 01 422.5
Int. Cl. F04b *23/04*
U.S. Cl. 417—364 10 Claims



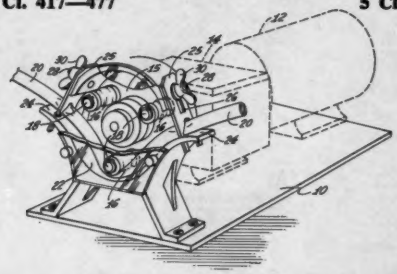
An internal-combustion engine has a rod fitted with a cam follower urged into contact with the engine camshaft. This rod actuates a stepped piston of a small hydraulic pump mounted directly on the engine block at the pedestal on which the fuel pump is normally seated. An end of the piston extends through the housing of the pump and is fitted with a plastic cap engaging the rocker arm of the engine fuel pump mounted in turn on the hydraulic-pump housing. The cam follower is an arcuate shoe engaging around a quarter of the surface of the cam and connected to the rod by a ball-and-socket joint.

3,567,344
ILLUMINATING DEVICE FOR ORIGINAL OF AN ELECTROPHOTOGRAPHIC DUPLICATING MACHINE
Masaya Ogawa, Osaka, and Yorio Yamanoi and Isao Iizaka, Toyokawa-shi, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Feb. 12, 1969, Ser. No. 798,675
Claims priority, application Japan, Feb. 15, 1968, 43/11,375
Int. Cl. G03b *15/02*
U.S. Cl. 355—8 6 Claims



An illuminating device for the original in an electrophotographic duplicating machine, which scans and projects an image of an original, illuminated by a light source on a photo-sensitive paper, which device causes the image to be uniformly bright. The image is formed longitudinally on an exposure slit which is disposed at right angles to the scanning direction.

3,567,345
PERISTALTIC PUMP
John W. Ballentine, Manhattan Beach, Calif., assignor to W. S. Shamban & Co., West Los Angeles, Calif.
Filed Feb. 10, 1969, Ser. No. 798,086
Int. Cl. F04b *43/00, 43/08*
U.S. Cl. 417—477 5 Claims

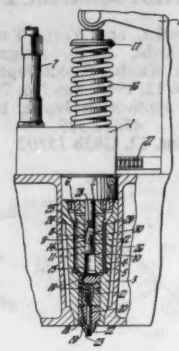


In a peristaltic pump wherein spaced impeller rollers on a rotor successively traverse a section of resiliently flexible tubing, the impeller rollers are shaped to flatten a central longitudinal portion of the tubing and to permit the opposite longitudinal edges of the flattened tubing to bulge to avoid excessive stressing of the tubing.

3,567,346
UNIT FUEL INJECTOR WITH MODULATED INJECTION
Lee T. Mekkes, Grandville, and Ernest Bader, Jr., Grand Rapids, Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed July 14, 1969, Ser. No. 841,371
Int. Cl. F04b *7/04*
U.S. Cl. 417—494 2 Claims

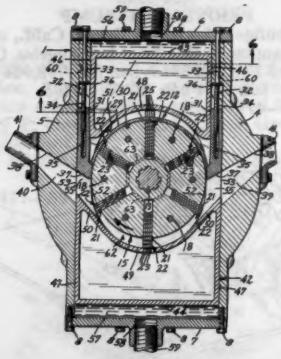
A jerk-type fuel injector-pump unit having a rotatively adjustable plunger and upper and lower main fill and by-pass ports in the pumping cylinder, each sequentially closable and openable by spaced helical lands on the plunger to effect beginning and ending of injection during the pumping stroke of the plunger, the groove between the lands being in continuous communication with the pumping cylinder inwardly of the plunger and also having rela-

tively brief communication with a separate by-pass port in the pumping cylinder while both main ports are closed



and the plunger is rotatively adjusted for maximum pump output.

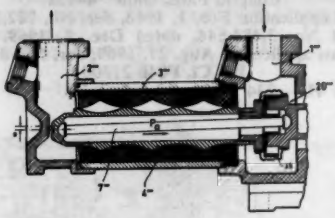
3,567,347
HYDRAULIC PUMP
Wilbert Milo Scott, 808 13th Ave. W., Williston, N. Dak. 58801
Filed Mar. 19, 1969, Ser. No. 808,548
Int. Cl. F01c *21/16*; F04c *15/04, 29/10*
U.S. Cl. 418—31 **2 Claims**



Casing means defining inlet and outlet ports and having a rotor equipped with impeller elements and journaled in the casing means on a fixed axis, the casing means defining a normally stationary semi-cylindrical wall surface in rotary sliding engagement with the rotor. A flow control member defines an arcuate surface diametrically opposed to the semi-cylindrical wall surface and radially movable toward and away from the rotor to define therewith an expansible and contractable pumping chamber, the flow control member including leg portions having impeller engaging surfaces tangent to the semi-cylindrical and arcuate surfaces in all positions of movement of the control member.

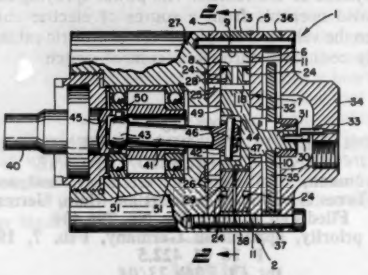
3,567,348
SCREW PUMP PROVIDED WITH A RADIALLY MOVABLE ROTOR COUPLING
Bengt A. Benson, Stockholm, Sweden, assignor to Stenberg-Flygt Aktiebolaget, Solna, Sweden
Filed Apr. 23, 1969, Ser. No. 818,719
Claims priority, application Sweden, Apr. 29, 1968, 5,776/68
Int. Cl. F01c *1/10, 5/00*; F04c *1/06*
U.S. Cl. 418—48 **9 Claims**

There is provided a novel type of coupling for use in helical pumps of the type which comprise a single rotor coacting with and eccentrically rotating in relation to a fixed stator, the novel coupling comprising an intermediate connector member which bridges the input and output



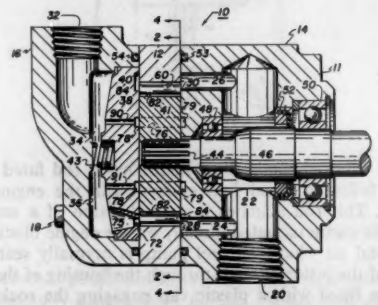
members of the coupling to transmit torque, and only torque, therebetween, the connector member being especially adapted to permit the use of various arbitrary means for absorbing axial forces occurring in the coupling.

3,567,349
LOW SPEED HIGH TORQUE FLUID VANE MOTOR
John W. Meulendyk, Kalamazoo, Mich., assignor to Pneumo Dynamics Corporation, Cleveland, Ohio
Filed July 11, 1968, Ser. No. 744,175
Int. Cl. F01c *1/04*
U.S. Cl. 418—61 **11 Claims**



A fluid vane motor in which either the rotor or housing is caused to roll around the periphery of the other through a proper sequencing of pressures to the vane chambers.

3,567,350
POWER TRANSMISSION
Albin J. Niemiec, Warren, Mich., assignor to Sperry Rand Corporation, Troy, Mich.
Filed Jan. 15, 1969, Ser. No. 791,362
Int. Cl. F01c *19/02*
U.S. Cl. 418—112 **23 Claims**



A rotary fluid pressure energy translating device having a vane cam track within which is rotatably mounted a rotor carrying radially sliding vanes to form fluid inlet

and fluid outlet zones located between the periphery of the rotor and vane track; and a sealing element disposed within the periphery of said rotor between each vane for creating a seal during the transition of the vanes between the fluid inlet and fluid outlet zones.

3,567,351
PERCUSSIVELY IGNITABLE FLASHBULBS HAVING MEANS FOR DETERMINING THE CONDITION THEREOF

Donald M. Harvey, Rochester, N.Y., assignor to Sylvania Electric Products Inc., Danvers, Mass.

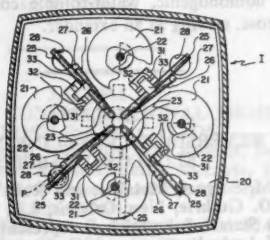
Filed Mar. 3, 1969, Ser. No. 803,779
Int. Cl. F21k *5/02*
U.S. Cl. 431—13 **5 Claims**

The metallic ignition member of a percussively ignitable flashbulb is coated with an insulating material which melts, burns, vaporizes or becomes conductive under the influence of the heat produced when the flashbulb is ignited. A pair of spaced electrical contact members are adapted to engage the coated ignition member to provide a switch in series with a signal lamp or the like. If the bulb has not been fired, the contact members are insulated from the metallic ignition member by the coating material so that the switch remains in an open condition. After the bulb is fired, the fingers are shorted by the metallic ignition member to close the switch and thereby energize the signal lamp.

3,567,352
SAFETY DEVICE FOR PERCUSSION-IGNITABLE FLASH UNITS

Clarence W. Van Duser, Rochester, N.Y., assignor to Sylvania Electric Products Inc., Danvers, Mass.

Original application Oct. 14, 1968, Ser. No. 767,097. Divided and this application May 7, 1969, Ser. No. 822,456
Int. Cl. F21k *5/02*
U.S. Cl. 431—93 **13 Claims**

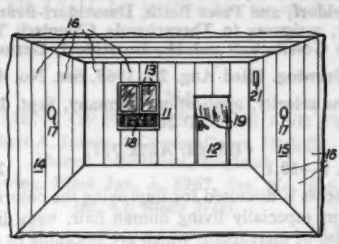


A photoflash unit having percussion-ignitable flash lamps and individual, preenergized strikers is provided with disarming latch members for each striker which prevent accidental release of the strikers. The disarming members have cam portions associable with photographic apparatus for moving the latch members to an inoperative position upon mounting of the flash unit on the apparatus. Apparatus is disclosed for cooperating during mounting of such units to arm the unit for selective release of the strikers. The disarming members are resiliently urged to their operative position so that unreleased striker elements are again disarmed upon removal of the flash unit from photographic apparatus.

3,567,353
THERMAL CONDITIONING SYSTEM

Paul Eisler, 57 Exeter Road, London, NW. 2, England

Original application May 26, 1965, Ser. No. 458,925, now Patent No. 3,410,336, dated Nov. 12, 1968. Divided and this application Aug. 29, 1968, Ser. No. 758,651
The portion of the term of the patent subsequent to Nov. 12, 1985, has been disclaimed
Int. Cl. F24f *3/14*
U.S. Cl. 165—21 **22 Claims**

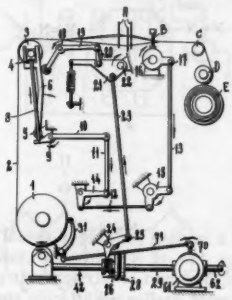


A space is maintained between 55 and 85 degrees Fahrenheit, and thereby below blood temperature. The boundary walls of the space are regulated as to temperature by a sensing device and a second sensing device responds to the temperature and humidity of the air in the space and controls the first sensing device. In this manner, the radiant loss from an occupant of the space to the walls amounts to about 400 B.t.u. per hour minus the heat exchange between the occupant and the air within the space. The walls may be covered by a detachable material having passages for a heat exchange medium or incorporating an electric heating film.

3,567,354
APPARATUS FOR CONTROLLING THE WARP TENSION IN A WEAVING MACHINE

Theodorus Franssen and Hubert van Mullekom, Deurne, Netherlands, assignors to N.V. Machinenfabriek L. Te Strake, Deurne, Netherlands

Filed Sept. 19, 1968, Ser. No. 760,805
Claims priority, application Netherlands, Sept. 20, 1967, 6712855
Int. Cl. D03c *49/06*
U.S. Cl. 139—108 **2 Claims**



The weaving machine has a back beam around which the warp is bent to provide two warp spans extending from the back beam at substantially a right angle to one

another. The back beam is mounted for movement in a direction substantially parallel to one of the two warp spans and is urged in such direction by resilient means to maintain the warp under predetermined tension. Mechanism is provided to operate in response to movement of the back beam in the opposite direction to feed the warp toward the back beam. The improvement comprises mechanism for reciprocating the back beam in a path substantially parallel to the other of the two warp spans, in synchronism with the opening and closing of the shed of the weaving machine, to counteract the tendency of the opening and closing of the shed to vary the tension of the warp.

CHEMICAL

3,567,355

MERCAPTANS FOR BOOSTING THE DYEING OF HUMAN HAIR WITH DIRECT DYES

Karl-Josef Boosen, Dusseldorf-Holthausen, Günter Reese, Dusseldorf, and Peter Berth, Dusseldorf-Benrath, Germany, assignors to Therachemie Chemisch Therapeutische Gesellschaft m.b.H., Dusseldorf, Germany

No Drawing. Filed Aug. 26, 1965, Ser. No. 482,895

Claims priority, application Germany, Sept. 2, 1964, T 26,920

Int. Cl. A61k *7/12*

U.S. Cl. 8—10.1 **24 Claims**

A process is disclosed for improving the coloring of human hair, especially living human hair, with direct dyes by the use of mercaptans which are insoluble or difficultly soluble in water. The mercaptans are mercaptocarboxylic acid esters and amides. Emulsions or dispersions of the mercaptans can be used to treat the hair prior to dyeing or they can be combined with the dyeing composition.

3,567,356

REACTIVE AND DISPERSE DYES FIXED ON CELLULOSE BLENDED FABRICS TRAVELLING ON DRUM RADIALLY PASSING HOT GAS

Hans-Ulrich von der Eltz and Richard Gross, Frankfurt am Main, and Kurt Petersen and Jurgen Schafer, Hofheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

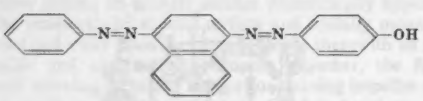
Filed May 10, 1967, Ser. No. 637,457

Claims priority, application Germany, May 11, 1966, F 49,172

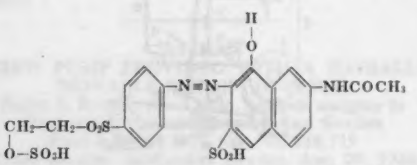
Int. Cl. D06p *3/82*

U.S. Cl. 8—21 **6 Claims**

Process for the simultaneous fixation of disperse and reactive dyestuffs such as



and



respectively, on a fabric such as made of a polyester and cellulose fiber blend by passing a heated gas such as air through said fabric which is trained around a plurality of perforated drums covered with a fine mesh sieve material of a mesh size, of less than 1 mm. and wherein said fabrics are printed or padded with the aforesaid dyestuffs.

3,567,357

DYESTUFF PREPARATIONS FOR THE DYEING OF SYNTHETIC POLYAMIDE OR POLYURETHANE FIBROUS MATERIALS

Edwin Baier, Frankfurt am Main, Günter Kaufmann, Kelkheim, Taunus, and Rudolf Löwenfeld, Buschschlag, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

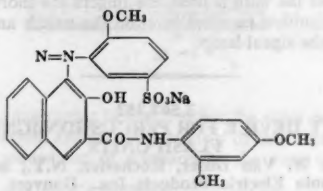
No Drawing. Filed May 14, 1968, Ser. No. 728,875

Claims priority, application Germany, Nov. 21, 1967, F 54,082

Int. Cl. C09b *27/00, 29/20*

U.S. Cl. 8—41 **2 Claims**

Dyestuff preparations for the dyeing of polyamide or polyurethane fibrous materials, characterized by a content of 20–45% by weight of the red azo dyestuff of the formula



0.5–5% by weight of an alkali metal halide, preferably sodium chloride, and 50–79.5% by weight of an inert, organic, nonionogenic, water-soluble compound, preferably sucrose, serving as an extender.

3,567,358

REVERSIBLE CROSS-LINKING OF CELLULOSIC FABRICS

Donald M. Soignet, Metairie, and Ruth R. Benerito and John D. Guthrie, New Orleans, La., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Aug. 29, 1969, Ser. No. 854,293

Int. Cl. D06m *13/20, 13/34, 13/54*

U.S. Cl. 8—116 **6 Claims**

Cellulosic fabrics are diethylaminoethylated and/or carboxymethylated and thereafter heated at elevated temperatures under vacuum for extended periods of time to form cross-links which may be removed by treatment with steam or alkaline solutions.

3,567,359

TREATMENT OF CELLULOSIC TEXTILE MATERIALS TO PROVIDE FIRE RESISTANCE THERETO

David Blackburn, Shaw, near Oldham, and Edward Haslam, Bolton, England, assignors to Courtaulds Limited, London, England

No Drawing. Filed Aug. 20, 1965, Ser. No. 481,398
Claims priority, application Great Britain, Aug. 21, 1964, 34,227/64
Int. Cl. D06m *13/34*
U.S. Cl. 8—116.2 14 Claims

The fire resistance of cellulosic material is improved by impregnating it with a non-volatile inorganic acid, cyanamide, and a halogenated alkyl phosphate and then heating to effect reaction between the cellulose and the impregnants.

3,567,360

METHOD FOR INTRODUCING CARBOXYALKYL AND/OR CARBAMOYLALKYL GROUPS INTO CELLULOSIC TEXTILE MATERIALS AND PRODUCTS THUS PRODUCED

Andrew G. Pierce, Jr., and Robert M. Reinhardt, New Orleans, La., assignors to the United States of America as represented by the Secretary of Agriculture

Filed Mar. 6, 1968, Ser. No. 711,023
Int. Cl. C08b *11/06, 11/14;* D06m *13/08*
U.S. Cl. 8—116.2 23 Claims

Cellulosic textile materials are etherified through treatment with a haloalkylamide or an N-substituted haloalkylamide. The carboxyl group content of the resulting material can be controlled by adjusting treatment conditions.

3,567,361

BIS-PYRROLIDONE-FORMALDEHYDE ADDITION PRODUCTS AND THEIR USE AS CROSSLINKING AGENTS WITH CELLULOSE

Sidney L. Vail, New Orleans, La., assignor to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Aug. 29, 1969, Ser. No. 854,292
Int. Cl. C07d *27/08;* D06m *13/14, 13/38*
U.S. Cl. 8—116.3 4 Claims

A new alkylene bis-pyrrolidone-formaldehyde addition product was prepared by the base catalyzed addition of ethylidenebis-3-(2-pyrrolidone) to formaldehyde in mole ratios of about from 1:1 to 1:3 in aqueous solvent. The neutralized solutions prepared of the new chemical compound were used effectively to crosslink cotton fabrics employing a pad-dry-cure procedure. The resultant fabrics were found to be wrinkle resistant and to have resistance to chlorine damage, and the crosslinks were resistant to acid and basic hydrolysis.

3,567,362

ERASURE OF CONFIGURATIONAL MEMORY IN CROSSLINKED COTTON

Hilda Z. Jung, John B. McKelvey, and Ruth R. Benerito, New Orleans, and Ralph J. Berni, Metairie, La., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Nov. 7, 1969, Ser. No. 874,952
Int. Cl. D06m *13/00*
U.S. Cl. 8—120 3 Claims

This invention relates to a chemical process by which conditioned and wet crease recovery can be imparted to cotton fabrics and by which the conditioned recovery alone can be removed without destroying the chemical crosslinks formed during the reaction by reacting the fabric with butadienediepoxide, mercerizing the fabric and then either reacting the fabric again with butadienediepoxide or heating the fabric under vacuum for an extended period.

3,567,363

MODIFICATION OF KERATIN TO THE S-SULFO FORM

Leszek January Wolfram, Rockville, Md., assignor to The Gillette Company, Boston, Mass.

No Drawing. Continuation-in-part of application Ser. No. 488,759, Sept. 20, 1965. This application June 27, 1969, Ser. No. 837,366
Int. Cl. A61k *7/10;* D06m *3/02*
U.S. Cl. 8—127.51 1 Claim

A composition in the form of a particulate mixture of reducing agent including water-soluble sulfite, bisulfite or hydrosulfite with oxidizing agent including water-soluble trithionate, tetrathionate, pentathionate or hexathionate, the composition being useful, when in water solution at pH 4.5–11, for treating hair or wool.

3,567,364

TREATMENT OF FABRICS, SKINS AND FURS

Robert A. James, 4 Grange Court, High St., Pinner, Middlesex, England

No Drawing. Filed Jan. 3, 1967, Ser. No. 606,585
Int. Cl. B08b *3/00*
U.S. Cl. 8—137 4 Claims

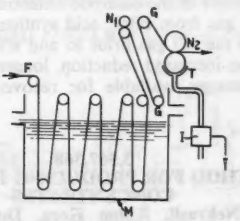
A composition for treatment of fabrics comprising a solution of water, sulphonated castor oil, glycerine and sodium hydroxide. The method of treating by brushing the surface of fabric with this solution and drying.

3,567,365

MONITORING THE WET PROCESSING OF A MATERIAL

Geoffrey James Parish, Manchester, England, assignor to The Cotton Silk and Man Made Fibres Research Association

Continuation-in-part of application Ser. No. 525,945, Feb. 8, 1966. This application Apr. 25, 1969, Ser. No. 819,165
Claims priority, application Great Britain, July 24, 1968, 35,296/68
The portion of the term of the patent subsequent to Feb. 10, 1967, has been disclaimed
Int. Cl. D06l *1/00*
U.S. Cl. 8—142 13 Claims



After material leaves apparatus, such as a washing machine or merceriser, in which it is wet processed, the liquid retained by the material is removed in two stages, e.g., by two separate pairs of nip rollers. Most of the liquid is removed in the first stage. Liquid removed in second stage is collected, and its nature, e.g., its pH, examined to give an indication of the characteristics of the material. Signal dependent upon indication may be used to adjust action of the apparatus.

3,567,366

SHORT CHAIN HYDROXYALKYL-, LONG CHAIN ALKYL SULFONIUM SALT ASSISTED DYEING OF NYLON WITH ANIONIC DYES

Hermann Sand, Wachenheim Pfalz, Harry Distler, Ludwigshafen (Rhine), and Willibald Ender, Heidelberg, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Feb. 5, 1968, Ser. No. 702,788
Claims priority, application Germany, Feb. 14, 1967, P 16 19 359.2
Int. Cl. D06p 5/02
U.S. Cl. 8—173 8 Claims

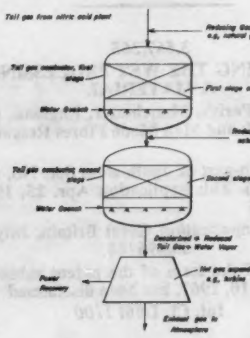
Process for dyeing or printing textile material of linear polyamide fibers with anionic azo dyes having from one to four sulfonic acid groups in which a tertiary trialkyl sulfonium salt is used as a dyeing assistant, the sulfur atom of the sulfonium salt being substituted by one or two hydroxyalkyl or dihydroxyalkyl substituents of 2 to 3 carbon atoms of the α-carbamoylmethyl-β-hydroxyethyl group with the remaining sulfur substituent being alkyl of 8 to 16 carbon atoms and one of the first mentioned substituents or groups being replaceable by methyl or ethyl.

3,567,367

METHOD OF REMOVING NITROGEN OXIDES FROM GASES

Paul Kandell, Matawan, N.J., and George Nemes, New York, N.Y., assignors to W. R. Grace & Co., New York, N.Y.

Filed Aug. 20, 1968, Ser. No. 753,967
Int. Cl. B01d 53/00
U.S. Cl. 23—2 5 Claims


Tail gas from nitric acid plant
Reducing Gas, e.g. natural gas
Tail gas reheater, first stage
First stage catalyst bed
Water Quench
Reducing Gas, e.g. natural gas
Tail gas reheating second stage
Second stage catalyst bed
Water Quench
Decolorized & Reduced Tail Gas+ Water Vapor
Power Recovery
Hot gas expander, e.g. turbine
Exhaust gas to Atmosphere

Improvement in the catalytic reduction of nitrogen oxides in tail gas from nitric acid synthesis, wherein water is added to the tail gas prior to and after final reduction so as to give increased reduction, longer catalyst life, and increased energy available for recovery in the treated effluent.

3,567,368

METHOD FOR PRODUCING RHODIUM CONCENTRATES

Frantisek Nekvasil, Kutna Hora, Dorboslav Dolezal, Rynovice, and Jiri Pelikan, Kutna Hora, Czechoslovakia, assignors to Ustav nerostynych surovin, Kutna Hora, Czechoslovakia

Filed Mar. 29, 1967, Ser. No. 627,594
Claims priority, application Czechoslovakia, Mar. 29, 1966, 2,059/66
Int. Cl. C01g 55/00
U.S. Cl. 23—51 2 Claims

A process for recovering a rhodium concentrate from an acid solution which comprises passing a rhodium containing solution through an anion exchanger column, precipitating cationic rhodium on said anion exchanger until a zone of cationic recovered rhodium is formed and eluting cationic rhodium from said zone.

3,567,369

ION EXCHANGE PROCESS FOR RECOVERING BORATES FROM BRINE

Elie M. Chemtob, Claremont, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

No Drawing. Filed Jan. 12, 1968, Ser. No. 697,539
Int. Cl. C01b 25/00
U.S. Cl. 23—59 12 Claims

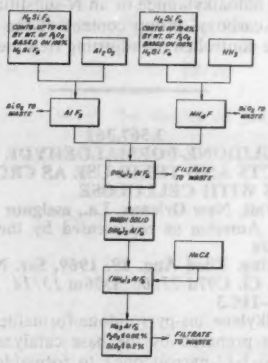
A process for recovering borates from borate-containing brines by contacting a boron-specific resin—for example, an insoluble cross-linked copolymer of a mixture of 85% to 99.5%, on a molar basis, of styrene and 0.5% to 15%, on a molar basis of divinylbenzene, the copolymer having attached to the aromatic nuclei thereof groups of the structure $--CH_2N(CH_3)C_6H_8(OH)_5$ in which the $—C_6H_8(OH)_5$ portion is the sorbityl radical, with a borate-containing brine to load the resin with borates and then eluting the loaded resin with water to remove the borates.

3,567,370

METHOD OF MAKING SYNTHETIC CRYOLITE

Warren E. Clifford, Danville, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Jan. 29, 1969, Ser. No. 795,115
Int. Cl. C01f 7/50, 7/54
U.S. Cl. 23—88 6 Claims



Synthetic white sodium cryolite of high purity is made from aluminum fluoride and ammonium fluoride, both compounds being prepared from impure fluosilicic acid containing up to 4% by weight of phosphatic impurities (calculated as P_2O_5 on the basis of 100% fluosilicic acid). The reaction product of ammonium fluoride and aluminum fluoride, i.e., ammonium cryolite, is separated from the impurities and is washed prior to metathesis with sodium chloride. The ammonium cryolite-sodium chloride reaction produces a synthetic sodium cryolite which contains less than 0.02% by weight of phosphatic impurities calculated as P_2O_5 and less than 0.2% by weight of SiO_2. Calcination of the sodium cryolite further reduces the SiO_2 content.

3,567,371

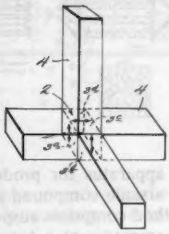
SODIUM CHLORIDE CRYSTALS

James Derek Birchall, Northwich, England, assignor to Imperial Chemical Industries Limited, London, England

Filed July 28, 1967, Ser. No. 656,678
Claims priority, application Great Britain, Aug. 17, 1966, 36,863/66
Int. Cl. C01d 3/04
U.S. Cl. 23—89 4 Claims

Preparation of a novel crystal form of sodium chloride by evaporating sodium chloride brines containing certain

additives. The novel crystal form comprises a cube having rectilinear columns of rectangular, usually square section attached perpendicularly to at least one pair of adjacent faces of the cubes. To the columns themselves can also be attached, perpendicularly, further rectilinear columns, and so on, and the perpendicular positioning holds the crystals apart from one another in the mass and the bulk-density of such a mass is consequently low. The additives include polyvinyl alcohol either alone or in association with polyelectrolytes that give rise to poly-



anions, and combinations of a water-soluble polyelectrolyte and salts able to yield inorganic ions that form insoluble or sparingly soluble salts with the polyions of the polyelectrolyte. Particularly effective is 1 to 100 parts by weight per million of brine of poly(vinyl alcohol) of molecular weight such that the viscosity of a 1% by weight aqueous solution at 20° C. is 1.1 to 1.6 centistokes; or a combination of 5 to 50 parts of sodium alginate and 250–500 parts of calcium ions by weight per million of brine.

3,567,372

SYNTHETIC CRYSTALLINE ZEOLITE

Heyman Clarke Duecker, Rockville, Md., and Armin Weiss and Carlos R. Guerra, Munich, Germany, assignors to W. R. Grace & Co., New York, N.Y.

No Drawing. Filed July 15, 1968, Ser. No. 744,634
Int. Cl. C01b *33/28*
U.S. Cl. 23—111 **2 Claims**

A synthetic zeolite having a pore diameter of 17 angstroms having a diamond type cubic crystal with lattice spacing $d_{111}=21.1\pm0.2$ angstroms and a unit cell of $a_0=36.7\pm0.3$ angstroms, prepared from aluminate and silicate solutions in the presence of varying amounts of sodium hydroxide.

3,567,373

LOW DONOR CONCENTRATION ZINC OXIDE AND DEVICES UTILIZING SAME

Andrew R. Hutson, Summit, and Robert A. Laudise, Berkeley Heights, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 29, 1967, Ser. No. 686,405
Int. Cl. C01g *9/02*
U.S. Cl. 23—147 **5 Claims**

Effective operation of acoustoelectric devices such as amplifiers, oscillators, circulators, isolators and switches requires high resistivity substantially uncompensated material. Uncompensated zinc oxide, otherwise considered the best material for such devices, has been unsuitable by reason of its large donor concentration. Substantially uncompensated material may now be prepared by a technique involving introduction of (1) lithium during hydrothermal growth, (2) replacement of lithium by zinc by heating in zinc vapor; and (3) out-diffusion of interstitial zinc by baking in oxygen.

3,567,374

UREA DETERMINATION

Donald R. Wybenga, Alhambra, Calif., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed July 24, 1968, Ser. No. 747,117
Int. Cl. G01n *21/22, 21/24, 33/16*
U.S. Cl. 23—230 **10 Claims**

A reagent for the determination of urea nitrogen in biological fluids using the diacetyl monoxime color reaction is prepared by dissolving thiosemicarbazide, a linearity-enhancing amount of urea and a stabilizing amount of a metal salt, preferably cadmium sulfate, in a mixture of phosphoric acid and sulfuric acid. The reagent has improved linearity, stability, photosensitivity and specificity properties. Methods of preparing the reagent and using it in the determination of urea nitrogen are disclosed.

3,567,375

PHOSPHORIC ACID MANUFACTURE FROM GYPSUM AND PHOSPHATE ROCK

William A. Satterwhite, Lakeland, and Fred J. Klem, Brandon, Fla., assignors to United States Steel Corporation, Pittsburgh, Pa.

No Drawing. Filed June 26, 1968, Ser. No. 740,079
Int. Cl. C01b *25/18*
U.S. Cl. 23—165 **10 Claims**

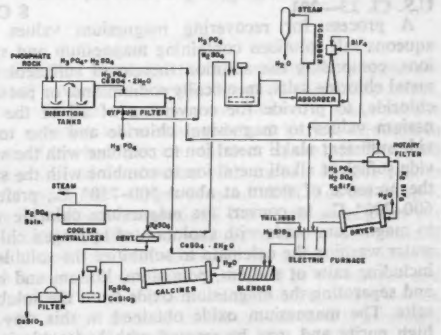
Phosphate rock is digested with sulfuric acid to produce phosphoric acid and calcium sulfate. An alkali metal sulfate, such as potassium or sodium sulfate, is reacted with fluosilicic acid to produce sulfuric acid and the potassium or sodium silicofluoride, the sulfuric acid being recycled to the digestion step. The silicofluoride is calcined with silicon oxide to produce the potassium or sodium silicate and silicon tetrafluoride. The calcium sulfate from the digestion step together with the potassium or sodium silicate are calcined to produce the potassium or sodium sulfate and calcium silicate. Water is added to the silicon tetrafluoride to produce fluosilicic acid, and the potassium or sodium sulfate and the fluosilicic acid are recycled to the reaction step described above for producing the sulfuric acid.

3,567,376

PREPARATION OF PHOSPHORIC ACID FROM GYPSUM AND PHOSPHATE ROCK

William A. Satterwhite, Lakeland, and Fred J. Klem, Brandon, Fla., assignors to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 740,079, June 26, 1968. This application June 27, 1968, Ser. No. 740,711
Int. Cl. B01j *1/00*; C01b *25/18, 33/00*
U.S. Cl. 23—165 **12 Claims**



Phosphate rock is digested with sulfuric acid to produce phosphoric acid and calcium sulfate. An alkali metal sulfate is reacted with fluosilicic acid to produce sulfuric

acid and the metal silicofluoride, the sulfuric acid being recycled to the digestion step. The silico-fluoride is calcined with silicon oxide to produce the alkali metal silicate and silicon tetrafluoride. The calcium sulfate from the digestion step together with the metal silicate are calcined to produce the metal sulfate and calcium silicate. Water in the form of weak phosphoric recycle is added to the silicon tetrafluoride to produce fluosilicic acid, and the metal sulfate and the fluosilicic acid are recycled to the reaction step described above for producing the sulfuric acid. To reduce the amount of water brought into the system and to reduce evaporation requirements, the metal sulfate may be separated by crystallization and may be dissolved in weak phosphoric acid recycle, and the silicon tetrafluoride may be absorbed in the solution to form the metal silicofluoride which when reacted with recycled fluosilicic acid generates the sulfuric acid.

3,567,377

RECOVERY OF SULFUR VALUES FROM SULFUR-BEARING MATERIALS

Philip A. Lefrancois, Cranford, Kenneth M. Barclay, Stockton, and James P. Van Hook, Basking Ridge, N.J., assignors to Pullman Incorporated, Chicago, Ill.

Filed Aug. 12, 1968, Ser. No. 751,934
Int. Cl. C01b *17/16;* C10g *19/08*
U.S. Cl. 23—181 **16 Claims**

A process for the recovery of sulfur from normally solid or liquid carbonaceous material used in a process for producing synthesis gas in which the material is introduced into a carbonate melt of sodium, and/or potassium and the sulfur of the sulfur-containing material is converted to a sulfide. The melt is dissolved in an aqueous solution of the acid salt of the metal carbonate to recover the sulfide in aqueous solution and the solution is then carbonated with carbon dioxide in the presence of an aqueous solution more concentrated in metal bicarbonate than the aqueous solution entering the carbonation zone to produce hydrogen sulfide which can be converted to sulfur and to preceipitate the acid salt of the metal carbonate which is converted to the carbonate and recycled to the process as the alkali metal carbonate melt.

3,567,378

RECOVERY OF MAGNESIUM VALUES FROM MAGNESIUM AND SULFATE CONTAINING AQUEOUS SALT SOLUTIONS

Lockwood W. Ferris, deceased, late of Salt Lake City, Utah, by Tracy Collins Bank and Trust Company, trustee, Salt Lake City, Utah, assignor to National Lead Company, New York, N.Y.

No Drawing. Filed Sept. 18, 1967, Ser. No. 668,711
Int. Cl. C01d *5/00;* C01f *5/10, 5/32*
U.S. Cl. 23—201 **8 Claims**

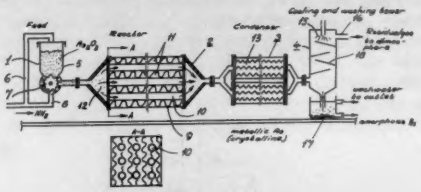
A process for recovering magnesium values from aqueous salt solutions containing magnesium and sulfate ions, comprising the addition thereto of sufficient alkali metal chloride salts, specifically sodium and/or potassium chloride, to provide for conversion of all of the magnesium values to magnesium chloride and also to provide sufficient alakli metal ion to combine with the sulfate vide sufficient alkali metal ion to combine with the sulfate the presence of steam at about 500–750° C., preferably 600–700° C., to convert the magnesium chloride values to magnesium oxide with evolution of hydrogen chloride, water washing the calcinate to solubilize the soluble salts including salts of sodium, potassium, lithium and boron, and separating the magnesium oxide from the solubilized salts. The magnesium oxide obtained in this way is of high purity and may be reacted with hydrochloric acid, such as that evolved from this process, to produce high purity magnesium chloride for use in the electrolytic production of magnesium metal.

3,567,379

METHOD AND APPARATUS FOR PRODUCING METALLIC ARSENIC

Sten Tycho Henriksson, Skelleftehamn, Sweden, assignor to Boliden Aktiebolag, Stockholm, Sweden

Filed Nov. 1, 1968, Ser. No. 772,771
Claims priority, application Sweden, Nov. 10, 1967, 15,469/67
Int. Cl. C22b *33/00*
U.S. Cl. 23—209 **7 Claims**



Method and apparatus for producing metallic arsenic by reducing an arsenic compound in gas phase with ammonia. The method comprises suspending arsenic troxide in a stream of ammonia at a temperature which causes decomposition of the ammonia by the arsenic trioxide and wherein the formed hydrogen reduces the arsenic trioxide to elementary arsenic in a homogeneous gas phase reaction, whereafter the gas mixture is cooled and the arsenic vapour condensed out to crystallinic arsenic.

The apparatus comprises a feed means from which a finely divided arsenic compound distributed in a stream of ammonia is metered to a reactor, where said stream is homogenized by vaporisation of the arsenic compound, a condenser for condensing formed arsenic in elementary crystallinic form, and a gas cleaning tower in which the gas is cleansed of residual arsenic.

3,567,380

CONTINUOUS CARBON FILAMENT PRODUCTION

Bruce Arnold Townsend, Rugby, England, assignor to Courtaulds Limited, London, England

Filed Aug. 26, 1968, Ser. No. 755,262
Int. Cl. C01b *31/07*
U.S. Cl. 23—209.1 **11 Claims**

A process for the production of carbon filaments which comprises feeding organic filamentary material, preferably polycarylonitrile filamentary material, or such material which has already been subjected to a prior heat treatment, continuously in a series of passes through a least one heat treatment zone in which the temperature increases as the filamentary material traverses the successive passes while the direction of travel of the filamentary material in each pass is substantially at right angles to the direction of increasing temperature.

3,567,381

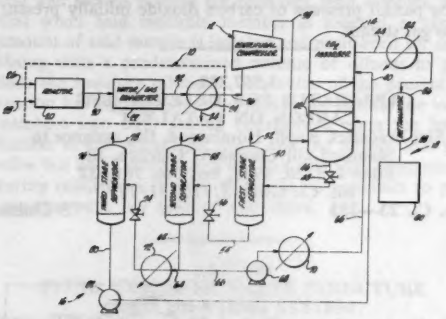
METHOD OF HYDROGEN MANUFACTURE

David K. Beavon, Long Beach, and Theodore R. Roszkowski, Malibu, Calif., assignors to The Ralph M. Parsons Company, Los Angeles, Calif.

Filed Sept. 22, 1967, Ser. No. 669,951
Int. Cl. C01b *1/16*
U.S. Cl. 23—212 **7 Claims**

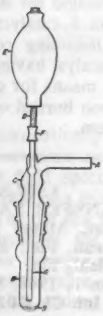
A hydrocarbon feed material is converted to a stream of hydrogen and carbon dioxide. The stream is compressed by centrifugal compression to a separation pressure and introduced into a carbon dioxide absorber. The carbon dioxide absorber employs a physical solvent to strip carbon dioxide from the compressed stream. The solvent is reclaimed by removing the solvent and solute carbon dioxide from the carbon dioxide absorber and

passing it through successive stages of pressure reduction. In each stage of pressure reduction carbon dioxide comes out of solution and is separated from its solvent.



The reclaimed solvent is recycled to the carbon dioxide absorber for reuse in stripping carbon dioxide from hydrogen.

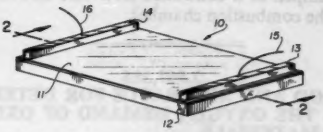
3,567,382
ISOCYANIDE INDICATOR
Eleanor V. Crabtree, Towson, and Edward J. Poziomek, Bel Air, Md., and Daniel J. Hoy, State College, Pa., assignors to the United States of America as represented by the Secretary of the Army
Filed Apr. 23, 1968, Ser. No. 723,487
Int. Cl. G01n *21/12, 31/06, 31/22*
U.S. Cl. 23—230 **7 Claims**



The colorimetric method of detecting the presence of microgram amounts of isocyanide groups in the various chemical compounds or mixtures comprising the steps of placing the chemical compound or mixture upon an inert support medium and then contacting with the detector a benzidine reagent or tetra base reagent producing a blue color indicating the presence of the isocyanide group.

3,567,383
HYDROGEN DETECTORS
Robert C. Langley, Millington, and Leonard R. Rubin, Union, N.J., assignors to Engelhard Minerals & Chemicals Corporation, Newark, N.J.
Filed Oct. 1, 1968, Ser. No. 764,271
Int. Cl. G01n *27/12, 27/26*
U.S. Cl. 23—230 **11 Claims**

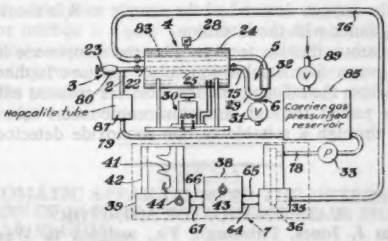
A detector for hydrogen has as its sensing device a thin film comprised of palladium or platinum oxide which oxide on contact with hydrogen reduces to the corresponding metal. Differences in properties, e.g. electrical or optical, of the oxide and metallic films are used to detect the presence of hydrogen.



3,567,384
CARBON BLACK PRODUCTION
William T. Nelson and Marvin M. Johnson, Bartlesville, Okla., assignors to Phillips Petroleum Company
No Drawing. Filed Mar. 24, 1969, Ser. No. 809,934
Int. Cl. C09c *1/48*
U.S. Cl. 23—209.5 **10 Claims**

A process for the production of carbon black by conversion of carbon monoxide in a hydrocarbon medium under reaction conditions above the critical temperature of the carbon monoxide, in the presence of a catalyst which is a dicyclopentadienyl derivative of a Group VIII metal of the Periodic Table.

3,567,385
METHOD AND APPARATUS FOR DETERMINING THE OXYGEN DEMAND OF OXIDIZABLE MATERIALS
Clayton E. Van Hall, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Continuation-in-part of application Ser. No. 710,249, Mar. 4, 1968. This application Feb. 3, 1969, Ser. No. 801,230
Int. Cl. G01n *31/10, 31/12, 33/16*
U.S. Cl. 23—230 **13 Claims**



Method and apparatus for determining the oxygen demand of a material containing oxidizable components, which method involves the combustion of a small sample of the material to be analyzed in a heated, continuous stream of carbon dioxide. Carbon monoxide produced as the result of combustion with carbon dioxide relates directly to the total oxygen demand (TOD) of the sample. Hence, quantitative analysis of the combustion gases for carbon monoxide yields a measure of the oxygen demand of the sample. By TOD is meant the net oxygen demand of the sample. Thus, oxygen dissolved in the sample and other oxidant source materials contained in the sample lower the oxygen demand of the sample as it is measured in accordance with the invention.

The carbon dioxide feed gas plus the sample are introduced into a combustion tube, moisture is then removed from the effluent, and the moisture-reduced effluent then

is passed through a suitable carbon monoxide detector. The effluent then is processed to convert carbon monoxide therein to carbon dioxide and the thus processed effluent is then pumped at a controlled flow rate and is re-introduced to the combustion chamber.

3,567,386

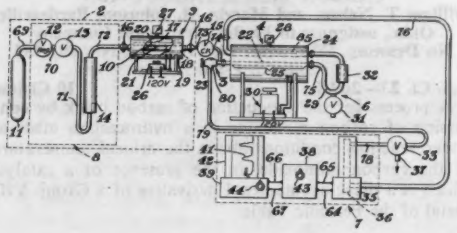
METHOD AND APPARATUS FOR DETERMINING THE OXYGEN DEMAND OF OXIDIZABLE MATERIALS

Vernon A. Stenger, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of application Ser. No. 710,339, Mar. 4, 1968. This application Feb. 3, 1969, Ser. No. 801,231

Int. Cl. G01n *31/10, 31/12, 33/16*

U.S. Cl. 23—230 **18 Claims**



Method and apparatus for determining the oxygen demand of a material containing oxidizable components, which method involves the combustion of a small sample of the material to be analyzed in a heated, continuous stream of carbon dioxide. Carbon monoxide produced as the result of combustion with carbon dioxide relates directly to the total oxygen demand (TOD) of the sample. Hence, quantitative analysis of the combustion gases for carbon monoxide yields a measure of the oxygen demand of the sample. By TOD is meant the net oxygen demand of the sample. Thus oxygen dissolved in the sample and other oxidant source materials contained in the sample lower the oxygen demand of the sample as it is measured in accordance with the invention.

The carbon dioxide feed gas plus the sample are introduced into a first combustion tube, moisture is then removed from the effluent, and the moisture-reduced effluent then is passed through a second combustion tube and thence through a suitable carbon monoxide detector.

3,567,387

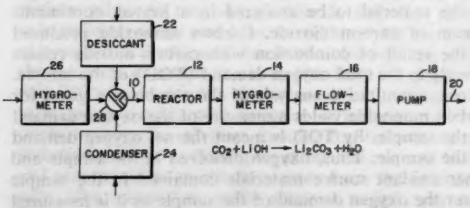
CARBON DIOXIDE MONITOR

William J. Jones, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 9, 1969, Ser. No. 789,982

Int. Cl. G01n *7/00, 7/14, 7/18, 33/18*

U.S. Cl. 23—232 **9 Claims**



An instrument for automatically and continuously monitoring the carbon dioxide partial pressure as for example in confined atmospheres of habitable environments, by reacting carbon dioxide in a sample gas stream with a hydroxide of an alkali metal or an alkaline earth metal to release water vapor and then measuring the increase in the partial pressure of water vapor in the gas stream, the partial pressure increase being related to the partial pressure of carbon dioxide initially present in the gas stream.

3,567,388

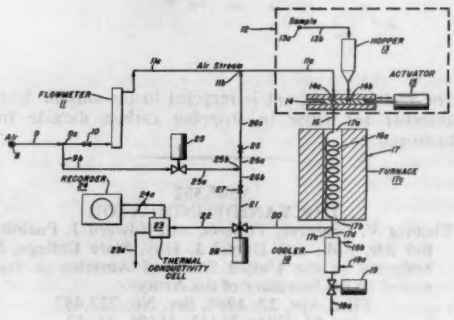
APPARATUS FOR DETERMINING CARBON ON CATALYST

Sixt Frederick Kapff, Homewood, Ill., assignor to Standard Oil Company, Chicago, Ill.

Filed Jan. 30, 1968, Ser. No. 701,632

Int. Cl. G01n *31/10, 31/12*

U.S. Cl. 23—253 **5 Claims**



Apparatus and method for determining the amount of carbon deposited on a catalyst, such as a hydrocarbon cracking catalyst, including combustion means, means for introducing a catalyst having carbon deposits into the combustion means, means for determining and recording the amount of carbon burned off the catalyst, and means for purging the system.

3,567,389

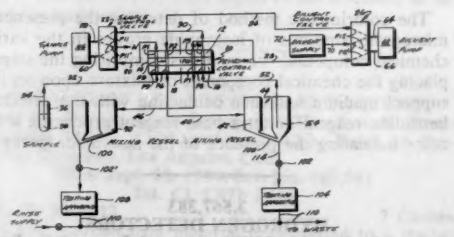
FLUID TRANSFER VALVE STRUCTURE

Wallace H. Coulter, Miami Springs, and William F. Rothermel, Hialeah, Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed Apr. 3, 1968, Ser. No. 718,545

Int. Cl. G01n *1/00*

U.S. Cl. 23—253 **12 Claims**



A transfer valve construction for a diluting system which automatically produces one or more sample dilutions of predetermined concentration from a first fluid specimen, while adapted to simultaneously commence dilution of a second fluid specimen before the desired dilutions of said first specimen are completed. The valve

including a plurality of members engaged in face-to-face contact, one of which is moveable relative to the remainder of the valve structure and capable of being indexed between a first and a second position. Said valve having a first and second portion for receiving fluid samples, such that when said movable member is indexed a precise amount of said sample is isolated and positioned for combining with a predetermined volume of diluent to produce the requisite dilutions. The valve of the present invention having fluid operated means for biasing the valve members into tight sealing engagement upon the introduction of the liquid specimens and the diluent into said valve but being deenergized to relax said tight engagement during relative movement of the valve members to prolong the work life span of said valve.

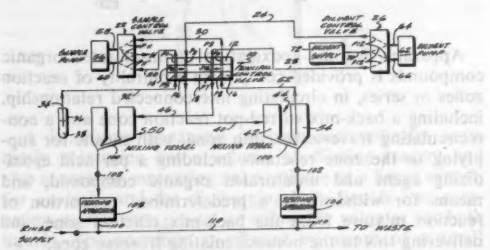
3,567,390
FLUID TRANSFER VALVE STRUCTURE AND DILUTING SYSTEM

William F. Rothermel, Hialeah, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Continuation-in-part of application Ser. No. 631,284, Apr. 17, 1967. This application Apr. 3, 1968, Ser. No. 718,605

Int. Cl. G01n *1/00*

U.S. Cl. 23—253 **15 Claims**



A diluting system for automatically producing one or more sample suspensions or dilutions of predetermined concentration from a first fluid specimen, while simultaneously commencing dilution of a second fluid specimen before the desired dilutions of the first are completed; and a novel transfer valve structure for use therein. The system employing means for drawing a fluid sample into a first portion of the transfer valve, wherein upon indexing of the valve a precise amount of said sample is subtended and mixed with a known quantity of diluent to provide a first fluid suspension of known concentrate. Means for drawing a portion of the first fluid suspension into a second portion of the valve, such that upon indexing of the valve back to its initial position, a precise amount of said first fluid suspension is subtended and mixed with a second volume of diluent to produce a second or final fluid suspension of determinable concentrate.

3,567,391
ANALYSIS FOR BIOCHEMICAL OXYGEN DEMAND

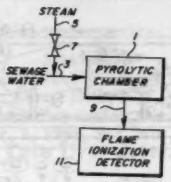
Ihor Lysyj, Canoga Park, and Kurt H. Nelson, Thousand Oaks, Calif., assignors to North American Rockwell Corporation

Continuation-in-part of application Ser. No. 672,190, Oct. 2, 1967. This application Sept. 22, 1969, Ser. No. 859,625

Int. Cl. G01n *31/12, 33/18*

U.S. Cl. 23—230 **5 Claims**

A rapid method for the analysis of waste water for biochemical oxygen demand. The method uses a pyrolysis chamber functionally connected to a hydrogen flame ionization detector so that first a value indicative of total organic content of a sample is determined and then that



value is converted by suitable factors to a value indicative of biochemical oxygen demand.

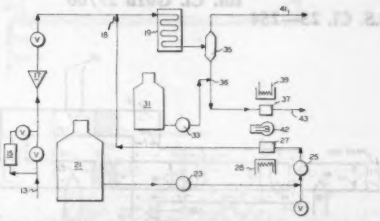
3,567,392
METHOD AND APPARATUS FOR ANALYSIS OF GASES FOR SULFUR DIOXIDE

Ferdinand Schulze, 3205 Fordham Road, Wilmington, Del. 19807

Filed Apr. 23, 1968, Ser. No. 723,419

Int. Cl. G01n *21/28, 31/06, 31/22*

U.S. Cl. 23—232 **5 Claims**



Sulfur dioxide in gas mixtures is determined by absorbing the sulfur dioxide in an alkaline solution containing a p-aminophenyl-azobenzene dye, e.g., p-(p-aminophenylazobenzene) sulfonic acid salt, then reacting with an acidic solution containing formaldehyde to form the more highly colored N-methyl sulfonic acid derivative of the dye and spectrally measuring the dye-derivative solution to determine the amount of sulfur dioxide.

The method is highly suitable for an apparatus for the continuous analysis of air, as in air pollution control, by providing pumping, metering and mixing of the gas and reagent streams in the proper sequence and photometric scanning of the resultant solution.

3,567,393
AUTOMATIC APPARATUS FOR THE DETERMINATION OF FLUIDS AND IN PARTICULAR BIOLOGICAL FLUIDS

Henry H. Welch, Rome, Italy, assignor to Poli-Mak S.r.l., Rome, Italy

Filed Jan. 24, 1968, Ser. No. 700,271

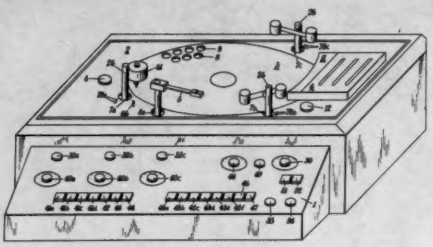
Claims priority, application Italy, July 3, 1967, 37,903/67

Int. Cl. G01n *31/00, 33/16*

U.S. Cl. 23—253 **6 Claims**

An automatic apparatus for the quantitative determination of fluids having a single motor. Electromagnetic valves control the quantitative addition of reagents. Means are provided for compensation and fine sensitivity control adjustments. An aspiration pump supplies the intermediate aspiration of variable amounts of sample and air by means of interchangeable cams. A single analytical plate is provided for containing the sample cups and the precalibrated reaction-measuring test tubes wherein the complete reaction and the colorimetric measurement is accomplished. The reagent additions is accomplished by gravity controlled by the electromagnetic valves. A transistorized power supply is provided for the colorimetric system which is stabilized for current variations. A power

supply is provided for auxiliary circuits independent from the power supply of the colorimetric system and electronic



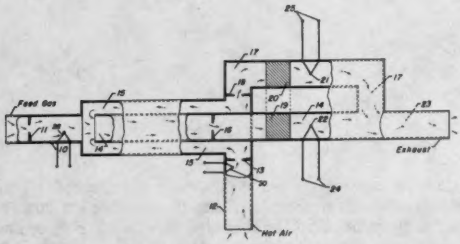
means programming automatically a plurality of specimens.

3,567,394

IMPURITY DETECTOR FOR GASEOUS STREAMS

Erwin C. Betz, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed May 16, 1968, Ser. No. 729,718
Int. Cl. G01n *27/00*
U.S. Cl. 23—254 3 Claims



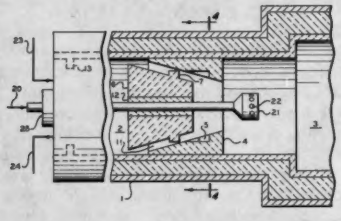
System for determining impurity concentration in a gaseous atmosphere. A known impurity gaseous stream and an unknown impurity gaseous stream are passed through parallel conversion zones to produce separate conversion product streams. These separate conversion product streams are passed through detection devices and the signal generated from such devices is quantitatively correlated with the impurity content of the unknown stream.

3,567,395

APPARATUS FOR PRODUCING CARBON BLACK

Eulas W. Henderson, Bartlesville, Okla., Glenn J. Forseth, Phillips, Tex., and Sheldon A. Cunningham, Corvallis, Oreg., assignors to Phillips Petroleum Company

Filed Oct. 21, 1968, Ser. No. 769,282
Int. Cl. C01b *31/00*; C09c *1/48*
U.S. Cl. 23—259.5 9 Claims



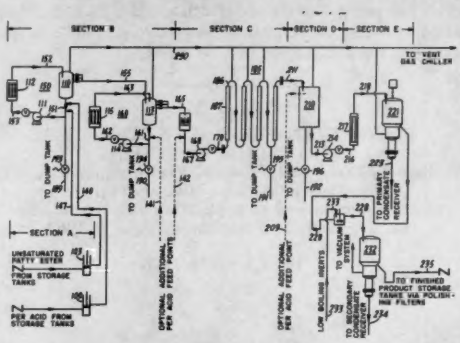
A choke for an axial type carbon black reactor which consists of an element slidably positionable along the axis of the axial tunnel, the passageway through the choke being adapted to be altered in respect to area.

3,567,396

APPARATUS FOR PREPARING EPOXIDIZED ORGANIC COMPOUNDS WHICH INCLUDES MORE THAN ONE REACTION ZONE

William E. Setzler, Jr., Seaford, N.Y., assignor to Argus Chemical Corporation, Brooklyn, N.Y.

Application Feb. 3, 1966, Ser. No. 533,109, now Patent No. 3,458,536, dated July 29, 1969, which is a continuation-in-part of application Ser. No. 440,856, Mar. 18, 1965. Divided and this application May 12, 1969, Ser. No. 858,211
Int. Cl. B01d *3/00*
U.S. Cl. 23—263 5 Claims



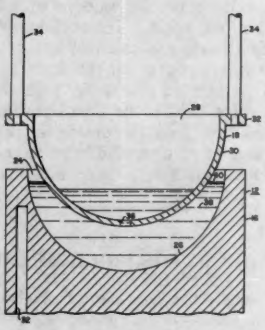
Apparatus for the epoxidation of unsaturated organic compounds is provided comprising a plurality of reaction zones in series, in circulating interconnected relationship, including a back-mix stirred-pot reaction zone and a nonrecirculating traverse reaction zone, with means for supplying to the zone reactants including a per acid epoxidizing agent and unsaturated organic compound, and means for withdrawing a predetermined proportion of reaction mixture from the back-mix reaction zone, and delivering this to the nonrecirculating traverse zone.

3,567,397

APPARATUS FOR OBTAINING A DROSS-FREE CRYSTALLINE GROWTH MELT

Sydney O'Hara, Menlo Park, Calif., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

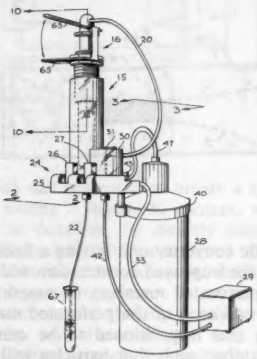
Filed Oct. 11, 1967, Ser. No. 674,448
Int. Cl. B01j *17/00*
U.S. Cl. 23—273 7 Claims



This invention provides apparatus for growing webbed dendritic semiconductor material from a melt substantially free of any dross on the surface of the melt. The apparatus comprises a two component crucible, consisting of an inner shell and an outer shell. The melt is formed in the outer shell. The inner shell, axially aligned with

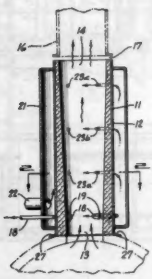
the outer shell, has a vertical displacement means attached to it. The inner shell is lowered into the melt of the outer shell and dross free melt is forced through an aperture in the apex of a cavity of the inner shell forming a pool of dross free melt therein. From this dross free melt the webbed dendritic semiconductor material is grown.

3,567,398
SEMI-AUTOMATIC PIPETTING AND DILUTER DEVICE
Andrew F. Farr, South Gate, Calif., assignor to Farr Devices, Inc., Southgate, Calif.
Filed Oct. 23, 1968, Ser. No. 769,825
Int. Cl. B01l *3/02*; G01f *11/28*
U.S. Cl. 23—259 **7 Claims**



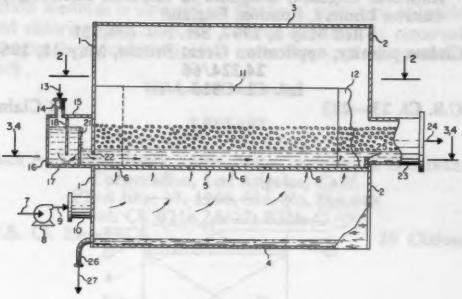
A laboratory apparatus for semi-automatically accurately measuring out a volume of diluting reagent and also accurately measuring out a volume of a liquid sample for analysis, and for discharging both liquids into a reaction vessel, with pre-set or adjustable volumes for both liquids. The operation is effected by means of a small motor driven air pump which provides air at increased or reduced pressures as required, and an air-permeable but hydrophobic porous membrane serves to fix the liquid level in the measuring pipette.

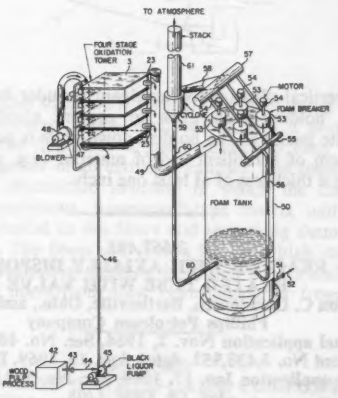
3,567,399
WASTE COMBUSTION AFTERBURNER
Berton G. Altmann, Los Gatos, and John D. Bailey, San Jose, Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.
Filed June 3, 1968, Ser. No. 733,919
Int. Cl. F23c *9/04*
U.S. Cl. 23—277 **3 Claims**



An afterburner for oxidizing gaseous wastes comprises an elongated, frustoconical refractory chamber of increasing internal cross-sectional area from entrance to exit. Near the entrance end, heat is introduced into the chamber to raise the temperature of the gaseous waste products to the point where they will spontaneously oxidize when mixed with fluent oxidizer. The fluent oxidizer (e.g., air) is introduced in spaced sequential fashion along the length of the chamber.

3,567,400
APPARATUS FOR OXIDATION OF BLACK LIQUOR
Indravadan S. Shah, Forest Hills, N.Y., assignor to Chemical Construction Corporation, New York, N.Y.
Filed Apr. 1, 1968, Ser. No. 717,740
Int. Cl. C01b *17/22*; D21c *11/02*
U.S. Cl. 23—260 **4 Claims**

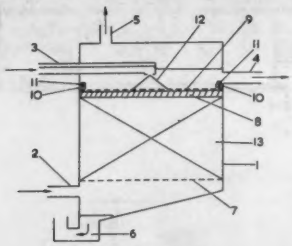




The apparatus for black liquid oxidation features a vertically oriented container which is provided with an internal horizontal perforated plate and at least one internal vertical baffle plate which extends upwards from the horizontal perforated plate. An air stream is passed via a fan or blower into the container below the perforated plate and air stream portions rise through the perforations. A stream of black liquor is passed via a pump and liquor seal inlet box into one end of the container above the perforated plate, and flows horizontally across the upper surface of the perforated plate parallel with and around the ends of the vertical baffle plates in a sinuous or serpentine flow path. The black liquor stream thus flows transverse to and in contact with the air stream portions rising through the plurality of perforations. The air stream portions are thereby dispersed into the black liquor stream, and the black liquor is oxidized with the concomitant generation of a foam. The resulting mixture of air, foam and oxidized black liquor is removed horizontally from an outlet end of the container above the perforated plate, via a substantially horizontal outlet conduit usually provided with a lower

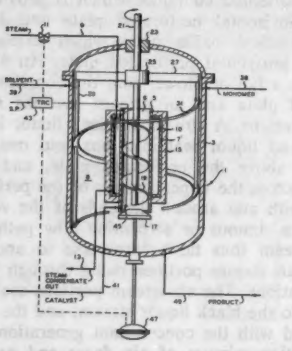
weir or other means for maintaining a liquor level on the perforated plate, and the mixture is passed to a vertically oriented defoaming vessel, which is provided with a lower outlet for removal of oxidized black liquor free of foam, upper mechanical means for breaking foam into separate liquid and gaseous phases, so that the liquid phase returns to the main body of oxidized liquor in the lower part of the vessel, and means to discharge the separated gaseous phase to atmosphere.

3,567,401
VERTICAL DENUDERS
Geoffrey Thomas Sheppard and Ronald Geoffrey Cottam, Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England
Filed May 5, 1967, Ser. No. 636,531
Claims priority, application Great Britain, May 31, 1966, 24,224/66
Int. Cl. C01d *1/04*
U.S. Cl. 23—283 **12 Claims**



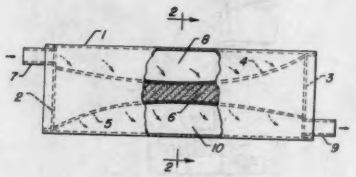
A vertical alkali-metal amalgam denuder having a resilient holding-down plate to prevent attrition of the graphite packing. The holding-down plate is preferably in the form of a resilient bed of material (e.g. wire mesh) having a thickness of at least one inch.

3,567,402
REACTOR WITH AXIALLY DISPOSED HEATED TUBE WITH VALVE
Don C. Christensen, Bartlesville, Okla., assignor to Phillips Petroleum Company
Original application Nov. 2, 1964, Ser. No. 408,184, now Patent No. 3,438,952, dated Apr. 15, 1969. Divided and this application Jan. 17, 1969, Ser. No. 792,080
Int. Cl. C08f *1/98*
U.S. Cl. 23—285 **3 Claims**



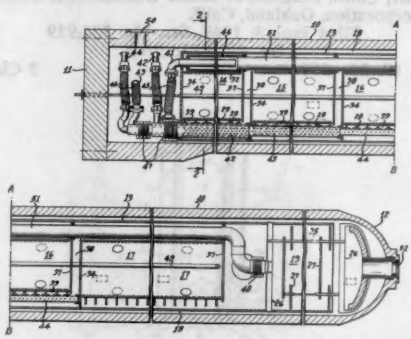
An adiabatic reactor has axially positioned therein a vertical jacketed tube provided with an auger to circulate material through the tube, said tube having a valve means at the bottom thereof to restrict circulation. Temperature within the jacketed tube is sensed and signal generated thereby utilized to control heat to said jacket and to open said valve.

3,567,403
EXHAUST GAS CATALYTIC CONVERTER
Martin W. Perga, Hoffman Estates, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
Filed Jan. 29, 1969, Ser. No. 795,122
Int. Cl. B01j *9/04*
U.S. Cl. 23—288 **4 Claims**



In a catalytic converter unit having a fixed bed of catalyst particles, the improved construction which uses a pair of opposing perforated members to support the catalyst therebetween and each of the perforated members is of a dished design that is positioned to be convex inwardly toward the catalyst such that particles will be held in a tight non-settling manner when the unit is subjected to expansion from high temperature operating conditions.

3,567,404
REACTOR VESSEL
Leonard C. Axelrod, Elizabeth, and Raymond S. Eagle, New Shrewsbury, N.J., James B. Fleming, Old Greenwich, Conn., and Gerhard M. Kahn, Flushing, and Orlando J. Quartulli, New York, N.Y., assignors to Pullman Incorporated, Chicago, Ill.
Filed Aug. 18, 1967, Ser. No. 661,673
Int. Cl. B01j *9/04*
U.S. Cl. 23—289 **5 Claims**



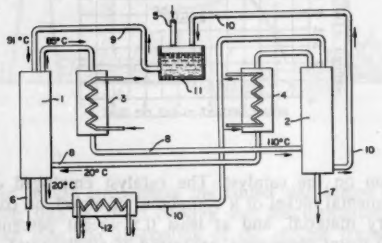
A reactor vessel having an outer shell, a heat exchanger and an inner shell, the inner shell containing a series of catalytic reaction beds having their entrance areas disposed parallel to the longitudinal axis of the outer and inner shells.

3,567,405

PROCESSING CRUDE POTASH SALTS USING DIRECT CONTACT HEAT EXCHANGER

Hans Hoppe, Sondershausen, and Manfred Schubert, Dresden, Germany, assignors to Kali-Forschungsinstitut, Sondershausen, Postfach, Germany

Filed Jan. 5, 1968, Ser. No. 695,920
Int. Cl. B01d 9/02; C01d 3/08
U.S. Cl. 23—299 2 Claims



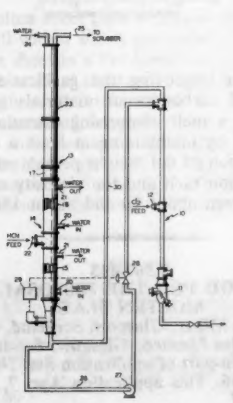
Crude potash salt is treated to obtain a coarse-grained salt mixture having a higher K content, which is suitable for use as fertilizer, by directly contacting a hot solution of the soluble components of the crude salt with an inert heat transfer medium insoluble in said solution and at a lower temperature, in countercurrent flow, to cool the solution and thereby precipitate the desired salt mixture by crystallization and then directly contacting the resultant cooled residual solution with the resultant heated heat transfer medium, in countercurrent flow, to heat the residual solution for dissolution therein of an additional quantity of the crude potash salt to be processed by the same steps.

3,567,406

METHOD AND APPARATUS FOR PRODUCING CYANOGEN CHLORIDE USING A FLOODED REACTOR

William John Evers, Mobile, Ala., assignor to Geigy Chemical Corporation, Ardsley, N.Y.

Filed Feb. 17, 1967, Ser. No. 616,875
Int. Cl. B01j 7/02; C01b 7/08; C01c 3/00
U.S. Cl. 23—359 6 Claims



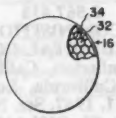
A reaction column flooded with a reaction medium is placed between a packed stripping column into which the reaction medium is pumped from the lower end of the flooded reaction column and a packed scrubbing column which is above the reaction column and into which gases from the reaction column flow to be scrubbed. Chlorine is fed from the stripping column into the bottom of the reaction column, hydrogen cyanide is fed into the middle of the reaction column, and water is fed into the top of the scrubbing column. The heat of reaction is removed from the flooded reactor by passing a cooling fluid around the outside of the reaction medium in the reaction column. Cyanogen chloride which has been scrubbed to remove hydrogen cyanide as it passes up the scrubbing column is removed from the top of the scrubbing column as a gas. The reaction medium is passed into the stripping column into which chlorine is fed and in the bottom of which is a steam reboiler, and in which the reaction medium is stripped of dissolved cyanogen chloride and chlorine and from the bottom of which is removed aqueous hydrochloric acid at concentrations up to about 26%.

3,567,407

COMPOSITE MATERIALS

Jack A. Yoblin, South Acton, Mass., assignor to Whittaker Corporation, Los Angeles, Calif.

Filed June 27, 1966, Ser. No. 560,648
Int. Cl. B21c 23/22; B32b 15/00
U.S. Cl. 29—191.4 10 Claims



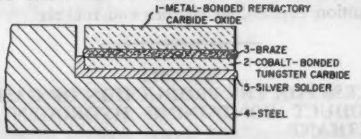
A composite structure is formed from a plurality of extended filamentary fibers, each coated with a protective cladding. The fibers are aligned parallel to each other, bundled together in an extrusion canister, and coextruded to form a monolithic structure in which the cladding forms a continuous, honeycomb-type matrix uniformly extrusion-bonded to the fibers and separating them from each other. The fibers are chosen for their high strength while the protective cladding is chosen for its ability to protect the fibers from their environment or from each other.

3,567,408

LAMINATED CARBIDE-OXIDE COMPOSITE

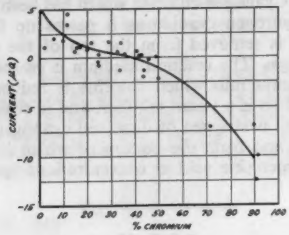
Dong M. Chay and Ralph K. Iler, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 25, 1968, Ser. No. 784,999
Int. Cl. B32b 15/16
U.S. Cl. 29—195 12 Claims



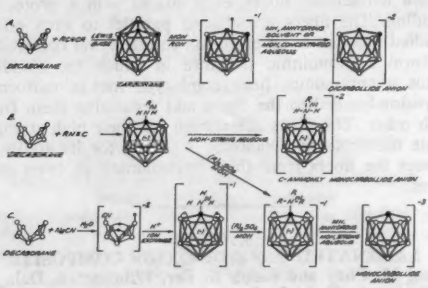
Disclosed are composite structures comprising (1) a dense, metal-bonded refractory carbide-oxide element metallurgically bonded with a copper-alloy to (2) a dense, cobalt-bonded tungsten carbide element having a substantially uniform coefficient of thermal expansion of from 0.5 to 1.5 times that of said carbide-oxide element. The composites are particularly useful as cutting edges for milling and turning cast iron and hardened steels.

3,567,409
SHEET STEEL COATED WITH AN ALUMINUM ALLOY
Bernard C. Seiler, Bethlehem, Pa., assignor to Bethlehem Steel Corporation
Filed Nov. 15, 1967, Ser. No. 684,901
Int. Cl. B32b *15/18, 15/20*
U.S. Cl. 29—196.2 **5 Claims**



A steel sheet, coated with an alloy of aluminum and chromium or titanium, for use as a container for beer. The coating composition is selected so that any galvanic current between the steel and the coating is minimal.

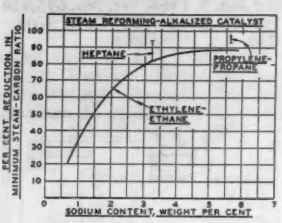
3,567,410
HYDROCARBON COMPOSITIONS CONTAINING CARBOLLYL METAL COMPLEXES
Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.
Filed Dec. 11, 1967, Ser. No. 689,527
Int. Cl. C10l *1/28*
U.S. Cl. 44—68 **9 Claims**



The invention comprises the use of carbollyl metal complexes as additives in hydrocarbon fuels and lubricants where they function as combustion improvers, antiknock agents and extreme pressure agents. Specific embodiments include use in fuels for spark and compression ignition engines, jet engines and rockets.

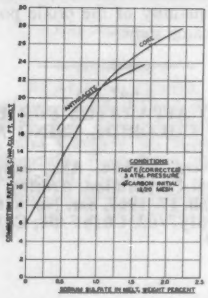
3,567,411
PROCESS FOR THE PRODUCTION OF GASEOUS PRODUCT CONTAINING HYDROGEN AND METHANE
Joseph F. McMahon, Iselin, N.J., assignor to Pullman Incorporated, New York, N.Y.
Original application Apr. 5, 1963, Ser. No. 270,892, now Patent No. 3,417,029, dated Dec. 17, 1968. Divided and this application Aug. 26, 1968, Ser. No. 826,031
The portion of the term of the patent subsequent to Jan. 28, 1981, has been disclaimed
Int. Cl. C01b *1/16, 2/16;* **C10g** *11/28*
U.S. Cl. 48—197 **3 Claims**

A process for the conversion of hydrocarbons with steam to produce gaseous product containing hydrogen and methane, or town's gas, which comprises contacting the hydrocarbon and steam with a particular catalyst at a temperature between about 600° F. and about 1000° F. such that there is substantially no deleterious carbon



deposition on the catalyst. The catalyst employed contains elemental nickel or a compound of nickel, an oxidic refractory material, and at least 0.5 weight percent of an alkali metal compound, expressed as alkali metal.

3,567,412
GASIFICATION OF CARBONACEOUS FUELS
Philip A. Lefrancois, Cranford, and Kenneth M. Barclay, Stockton, N.J., assignors to Pullman Incorporated, Chicago, Ill.
Filed Aug. 12, 1968, Ser. No. 751,932
Int. Cl. C10j *3/16;* **C10g** *9/34*
U.S. Cl. 48—202 **20 Claims**

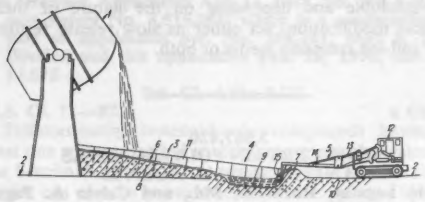


A method for improving the gasification and combustion rates of carbonaceous materials in a reaction zone containing a melt comprising essentially an alkali metal carbonate by maintaining at least a critical minimum concentration of 0.4 weight percent of sodium sulfate in the reaction melt and the viscosity of the melt is maintained between about 10 and about 150 centipoises.

3,567,413
METHOD FOR THE DISPOSAL OF MOLTEN SLAG
William B. Y. Miller, Glasgow, Scotland, assignor to Colvilles Limited, Glasgow, Scotland
Continuation-in-part of application Ser. No. 555,591, June 6, 1966. This application Apr. 7, 1969, Ser. No. 822,817
Int. Cl. C03b *5/08*
U.S. Cl. 65—19 **1 Claim**

In a process for forming hard slag lumps from molten slag, the molten slag is poured from an L–D type steelmaking vessel into a receiver having a destructible wall made of cool hard slag lumps comparable in size to the

slag-lumps product desired, and a mobile boom-and-blade implement is then manipulated to treat the substantially uncooled pouring with the cool slag lumps of the wall, the treatment including adding the cool slag lumps of the wall to the molten slag pouring and agitating together in the atmosphere the added slag lumps and the molten slag to effect cooling and fragmentation of the molten slag and air-cooling of the molten fragments to slag lumps which are readily removable with the added slag lumps from the vicinity of the vessel.

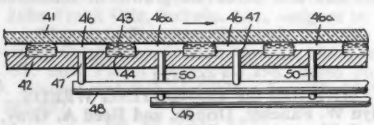


3,567,414

METHOD AND APPARATUS FOR SUPPORTING GLASS SHEET BY COMBINED ACTION OF LIQUID AND GAS

Stephane Dufaure de Lajarte, Paris, France, assignor to Compagnie de Saint-Gobain, Neuilly-sur-Seine, France

Continuation-in-part of application Ser. No. 337,066, Jan. 10, 1964, now Patent No. 3,410,672. This application Dec. 26, 1967, Ser. No. 693,515
Claims priority, application France, Jan. 12, 1963, 921,331
Int. Cl. C03b *18/00, 39/00*
U.S. Cl. 65—25 **9 Claims**



Moving molten sheet glass is supported on liquid lands forming annuli within which gas under pressure combines to support the sheet in a flat condition. Lengths of drawn material, such as glass sheet, are sequentially passed over and in fluid-tight contact with liquid or molten metal lands forming enclosures of respective areas of the sheet instantaneously contacted and supported by the lands, while passing treating fluid into such enclosures to effect a predetermined treatment of the glass. The treating fluids are under low pressure, which assists in supporting the sheet.

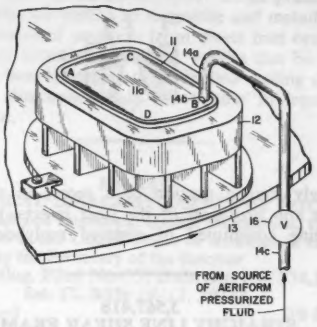
3,567,415

METHOD OF CORRECTING CONTOURS OF TELEVISION VIEWING PANELS

Lynn A. Carpenter, State College, Pa., assignor to Corning Glass Works, Corning, N.Y.

Filed Sept. 16, 1968, Ser. No. 759,957
Int. Cl. C03b *11/02*
U.S. Cl. 65—69 **2 Claims**

A method of correcting the contours of the face plates of rectangular press-formed glass viewing panels for television picture tubes prior to the removal of the panels from their forming molds. The method comprises directing a stream of low pressure pressurized aeriform cooling fluid into the interior of the panels at a selected area of each of the face plates thereof and substantially normal to the chord of the curvature of said areas of the face plates. The cooling effect of said cooling fluid causes said panels to separate from their forming molds more than usual in said area and thereby change the shape or contour of the panels.

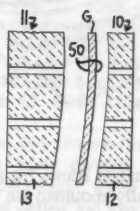


3,567,416

METHOD OF PRESS BENDING GLASS SHEETS

George W. Stilley, Freeport, and Joseph D. Kelly, Cheswick, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 19, 1968, Ser. No. 699,131
Int. Cl. C03b *23/02*
U.S. Cl. 65—106 **4 Claims**



Press bending glass sheets between shaping molds having controlled temperature during the press bending operation. The temperature of the molds is controlled within a temperature range such that when the molds engage the glass surfaces shaping the latter, they cool the glass surfaces at approximately the same cooling rate as the ambient atmosphere in spaces throughout the mold faces.

3,567,417

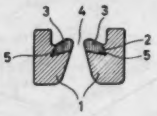
NOZZLE FOR DRAWING CORD-FREE PLATE GLASS

Ernst Winter, Weiden, Upper Palatinate, Germany, assignor to Flachglas-Aktiengesellschaft Delog-Detag, Furth, Bavaria, Germany

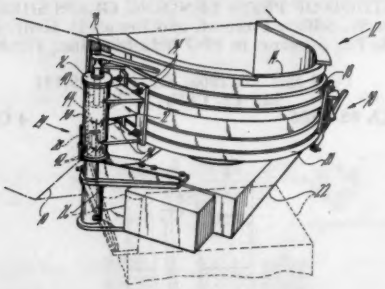
Filed July 10, 1968, Ser. No. 743,846
Claims priority, application Germany, Dec. 20, 1967, D 54,908
Int. Cl. C03b *15/02*
U.S. Cl. 65—193 **2 Claims**

A nozzle for drawing cord-free plate glass, comprising a chamotte nozzle body having a straight slot extending essentially the entire width of the nozzle body and tapered at both its ends, through which slot the molten glass is

extracted for drawing, and liner inserts secured in said body and conformed to the shape of the nozzle slot and extending over its entire useful length. The inserts have a wedge-shaped cross-section and are lodged in a correspondingly shaped portion of a recess in the body to prevents any lifting-off of the liner inserts, the liner inserts being constituted of sintered molybdenum disilicide.



3,567,418
STRAIGHT LINE SHEAR FRAME MOUNTING MECHANISM
Harald Hoette, Farmington, Conn., assignor to Emhart Corporation, Bloomfield, Conn.
Filed Apr. 29, 1968, Ser. No. 725,118
Int. Cl. C03b *5/26, 5/38*
U.S. Cl. 65—325 **5 Claims**



A rectangularly shaped frame for a plurality of straight line shears is pivotally mounted on a pivot post carried on one side of a glass feeding apparatus spout casing so that the frame is movable from and to a position beneath the outlet spout. The pivot post is rotatably supported in a bracket which is adjustably mounted on arcuately shaped gibs defined on the spout casing, and said post is vertically adjustable in this bracket. The gibs on the casing also carry a toggle clamp, which clamp is also adjustably mounted thereon to engage a clamp plate provided on a diagonally opposite corner of the shear frame from the corner associated with the pivot post.

3,567,419
PLANT GROWTH REGULANT MATERIAL
Ronald Alfred Dean, Laleham, John Sidney Ashford, Hampton Hill, and Patrick Gould, Woodham, near Weybridge, England, assignors to The British Petroleum Company Limited, London, England
No Drawing. Continuation of application Ser. No. 509,439, Nov. 23, 1969. This application Apr. 22, 1969, Ser. No. 818,455
Claims priority, application Great Britain, Nov. 24, 1964, 47,722/64, 47,723/64
Int. Cl. C05f *11/00*
U.S. Cl. 71—11 **4 Claims**

A method of treating soil to improve its ability to promote and support plant life is provided which comprises adding to the soil a solid, water-insoluble plant growth regulant consisting essentially of an aromatic-containing petroleum fraction, modified to contain, in chemically bound form, at least one component selected from the group consisting of the essential plant nutritive elements and ionic groups. These modified materials are solid and water-insoluble and depending on the nature of their chemical modification, act either as slow release fertilisers or soil-ion retention media or both.

3,567,420
USE OF CERTAIN POLYAMINES AS ANTIMICROBIAL AGENTS
Marvin Legator, Rockville, Md., and Calvin A. Page, Modesto, Calif., assignors to Shell Oil Company, New York, N.Y.
No Drawing. Continuation of application Ser. No. 513,569, Dec. 13, 1965. This application Apr. 8, 1969, Ser. No. 816,163
Int. Cl. A01n *9/20*
U.S. Cl. 71—67 **9 Claims**

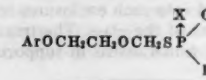
Use of certain reaction products of amines and polyepihalohydrins, salts thereof and corresponding quaternary ammonium derivatives for controlling microorganisms.

3,567,421
TREATMENT OF MUNG BEAN SEEDS
Dale H. Pape and William E. Neel, Archbold, Ohio, assignors to Beatrice Foods Co., Chicago, Ill.
No Drawing. Filed Mar. 14, 1969, Ser. No. 807,420
Int. Cl. A01n *21/02*
U.S. Cl. 71—76 **10 Claims**

Legume seeds, preferably mung bean seeds, are soaked with a mixture of p-chlorophenoxyacetic acid and α,α,α-trifluoro - 2,6 - dinitro-N,N-dipropyl-p-toluidine (trifluralin). The use of trifluralin increases the yield of sprouts and gives shorter, fatter sprouts. The addition of p-chlorophenoxyacetic acid curbs the growth of undesired root hairs.

3,567,422
METHOD OF COMBATING WEEDS
Llewellyn W. Fancher, Orinda, and Reed A. Gray, Saratoga, Calif., assignors to Stauffer Chemical Company, New York, N.Y.
No Drawing. Application Sept. 11, 1967, Ser. No. 666,992, now Patent No. 3,504,057, dated Mar. 31, 1970, which is a continuation-in-part of application Ser. No. 427,500, Jan. 22, 1965. Divided and this application Aug. 25, 1969, Ser. No. 870,785
Int. Cl. A01n *9/36*
U.S. Cl. 71—87 **6 Claims**

Compounds corresponding to the formula



in which X is oxygen or sulfur, R is lower alkyl, R^1 is lower alkyl or lower alkoxy, and Ar is a nuclear polychlorinated phenyl or naphthyl. The polychlorination is from 2 to 5 chlorine atoms. The naphthyl nuclei are bonded through either the α or β nuclear carbon atoms. The above compounds are effective herbicides, particularly for the control of grasses and broadleaf plants with both preemergence and post-emergence activity. Representative compounds are: 2,4-dichlorophenoxyethyl-oxymethyl-0,0-diethyl phosphorodithioate, β-naphthoxyethyl-oxymethyl-0,0-dimethylphosphorodithioate, 2,4,5 - trichlorophenoxyethyloxymethyl-0,0 - diethylphosphorothioate, 2,4,5 - trichlorophenoxyethyl-0-ethylmethylphosphenedithioate.

3,567,423
HERBICIDAL TRIFLUOROMETHYL BENZIMIDAZOLES

Harry Goldsmith, Brea, and Robert F. Crawford, La Mirada, Calif., assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.

No Drawing. Application Apr. 11, 1967, Ser. No. 629,930, now Patent No. 3,515,866, which is a continuation-in-part of application Ser. No. 366,141, May 8, 1964. Divided and this application Feb. 26, 1970, Ser. No. 14,675

Int. Cl. A01n *9/22*

U.S. Cl. 71—92 6 Claims

Trifluoromethyl-benzimidazole compounds having at least one trifluoromethyl substituent on a carbon atom of the benzimidazole molecule are provided. The benzimidazoles can also be substituted with other groups such as alkyl, halogen and alkoxy. The compounds are especially useful as herbicides for controlling weed growth.

3,567,424
CHEMICAL REGULATION OF PLANT PROTEIN CONTENT

Stanley K. Ries, East Lansing, Mich., assignor to The Battelle Development Corporation, Columbus, Ohio

No Drawing. Filed Feb. 8, 1968, Ser. No. 703,893

Int. Cl. A01n *5/00*

U.S. Cl. 71—93 9 Claims

Chemical regulation of plant protein content through growing a susceptible crop plant in an environment containing a low-level, non-phytotoxic concentration of a certain organic chemical agent and a nitrate source of a nitrogen plant nutrient with the certain organic chemical agent being a particular triazine, uracil, or phenyl-substituted urea, and preferably being simazine.

3,567,425
HERBICIDAL N-FORMYLCARBANILATES

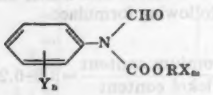
John Frank Olin, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Original application Mar. 21, 1966, Ser. No. 535,737, now Patent No. 3,457,296, dated July 22, 1969. Divided and this application Jan. 10, 1969, Ser. No. 801,907

Int. Cl. A01n *9/20*

U.S. Cl. 71—111 19 Claims

Phytotoxic composition, and method of use, comprising as the active ingredient a compound of the formula:



wherein Y is halogen, hydroxyl, alkyl or alkoxy having not more than 5 carbon atoms, R is hydrocarbyl of not more than 5 carbon atoms selected from the group consisting of alkyl, alkenyl and alkynyl, X is halogen (Cl, Br, I and F), *n* is an integer from 0 to 5, inclusive, and *m* is an integer from 0 to 3, inclusive.

3,567,426
DIRECT IRON ORE REDUCTION PROCESSES

Marnell A. Segura, Baton Rouge, and Leo Broussard, Parish, La., assignors to Esso Research and Engineering Company

No Drawing. Filed Apr. 29, 1968, Ser. No. 725,137

Int. Cl. C21b *1/06*

U.S. Cl. 75—1 6 Claims

This invention relates to a process for increasing the iron values of wustite products by disproportionation of wustite at relatively mild conditions. In particular, the free metal content of wustite-containing reduced iron products can be increased by providing sufficient holding time, at relatively low temperatures, ranging generally from about 500° F. to about 1000° F. to produce disproportionation of wustite to magnetite and metallic iron. The iron content of products from direct iron ore reduction processes containing residual wustite can be readily increased by heat treatment or controlled cooling at times sufficient to disproportionate the wustite to iron metal and magnetite.

3,567,427
CHEMICAL DISAGGREGATION OF ROCK

Ray V. Huff and Larman J. Heath, Bartlesville, Okla., assignors to the United States of America as represented by the Secretary of the Interior

No Drawing. Filed Nov. 7, 1968, Ser. No. 774,172

Int. Cl. B02c *19/12, 19/18*

U.S. Cl. 75—1 10 Claims

Rock containing certain clay minerals is chemically disaggregated by treatment with a compound which causes a rupturing or negation of the bonding between unit cells of the clay mineral. The clay minerals may be illite, illite-type, mixed lattice minerals of the illite type or mixture thereof. The treatment compound may be hydrazine, hydrogen peroxide or mixtures thereof. The treatment of the clay minerals may be in situ.

3,567,428
PROCESS FOR COLD HARDENING OF PELLETS

Karl Jonas Valter Svensson, Strassa, Sweden, assignor to Trafikaktiebolaget Grangesberg-Oxelosund, Stockholm, Sweden

No Drawing. Filed Jan. 21, 1969, Ser. No. 792,777

Claims priority, application Sweden, Jan. 16, 1968, 1,052/68

The portion of the term of the patent subsequent to Jan. 20, 1987, has been disclaimed

Int. Cl. C21b *1/24*

U.S. Cl. 75—3 4 Claims

The invention relates to a process for the cold hardening of pellets comprising finely divided metal oxide, finely divided hydraulic binding agent, water and coke breeze or petroleum coke. Green pellets are produced and then embedded in a mass of the finely divided metal oxide in such a way that, in principle they are isolated from each other. The mass of the finely divided metal oxide is separated when the pellets, thanks to the setting effect of the hydraulic binding agent have achieved an acceptable strength.

3,567,429
PROCESS FOR PREPARING A STRONTIUM AND/OR BARIUM ALLOY

Eckhard Dunkel, Frankfurt am Main, and Wolfgang Thiele, Bad Homburg, vor der Hohe, Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

No Drawing. Filed Sept. 9, 1968, Ser. No. 758,605

Claims priority, application Germany, Sept. 21, 1967, P 16 08 245.4

Int. Cl. C22d *7/06*

U.S. Cl. 75—10 2 Claims

Strontium and/or barium are charged into a silicon melt having a temperature of from 650 to 1700° C. and containing from 0.5% to 70% of magnesium, calcium, or aluminum, and a flux. The melt is stirred vigorously. Substantially all of the strontium and/or barium is alloyed. The alloy is then used to refine aluminum.

3,567,430

METHOD OF REMOVING LEAD FROM MOLTEN AUSTENITIC STAINLESS STEEL

John W. Engroff, Natrona Heights, Pa., assignor to Allegheny Ludlum Steel Corporation, Brackenridge, Pa.

No Drawing. Filed June 11, 1968, Ser. No. 736,030
Int. Cl. C21c 5/52
U.S. Cl. 75—12 6 Claims

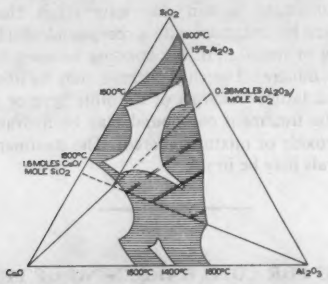
A method of reducing lead content in the molten bath of steel below 0.003% comprising substantially removing the slag cover from the molten bath, charging the melt with carbon, and oxidizing the melt to remove carbon and lead.

3,567,431

PRODUCTION OF MAGNESIUM IN SLAG OF RESTRICTED CaO CONTENT

Walther Schmidt, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed July 5, 1967, Ser. No. 651,216
Int. Cl. C22b 45/00
U.S. Cl. 75—67 2 Claims



Magnesium oxide and calcium oxide, in respective molar proportions varying from 4:1 to 8:1, are fed into an electric furnace into which a metallic silicon-containing reductant, having approximately equal contents by weight of Si and Al and also containing iron and titanium, is fed in matched proportion to the CaO in order to maintain a liquid slag bath having CaO and SiO_2 in respective molar ratios varying from about 0.5:1.0 to about 1.2:1.0, whereby the weight of slag which is produced is approximately twice the weight of magnesium metal product.

3,567,432

METAL CASTING

Anthony Charles Wardell, Nechells, Birmingham, England, assignor to Foseco International Limited, Birmingham, England

No Drawing. Filed July 31, 1967, Ser. No. 657,063
Claims priority, application Great Britain, Aug. 16, 1966, 36,626/66
Int. Cl. C22b 9/10; C23c 1/12
U.S. Cl. 75—94 7 Claims

In the production of steel ingots, the steel is poured into the ingot mould through a flux layer, the flux including at least one fluoride, and at least one alkali metal carbonate. Preferred flux compositions include calcium fluoride, sodium carbonate, anthracene, calcium oxide and ferrosilicon.

3,567,433

METHOD OF RECOVERING METALS FROM SPENT HYDROREFINING CATALYSTS

George Gutnikov, Los Angeles, Calif., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed Feb. 14, 1968, Ser. No. 705,285
Int. Cl. C22b 3/00
U.S. Cl. 75—103 3 Claims

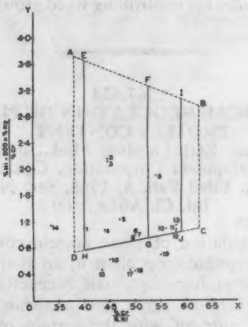
Recovery of metals from a spent metals-laden hydrorefining catalyst. Carbonaceous matter is burned from the spent catalyst which is thereafter extracted with aqueous ammonia or ammonium carbonate solution to recover molybdenum, nickel and vanadium therefrom.

3,567,434

STAINLESS STEELS

William Henry Richardson, Datchet, and Prodyot Guha, High Wycombe, England, assignors to Langley Alloys Limited, Slough, England

Filed Mar. 14, 1968, Ser. No. 713,017
Claims priority, application Great Britain, Mar. 17, 1967, 12,708/67
Int. Cl. C22c 39/20
U.S. Cl. 75—125 7 Claims



A corrosion resistant and wear resistant high strength ferritic-austenitic steel consisting of:

	Percent
Chromium	23.0–30.0
Nickel	4.0–7.0
Molybdenum	1.0–5.0
Copper	1.0–4.0
Silicon	0.2–2.0
Manganese	0.2–4.0
Carbon	0.01–0.1
Nitrogen	0.06–0.4
Iron (excepting unavoidable impurities)	Balance

and wherein the chromium and nickel and nitrogen contents satisfy the following formulae:

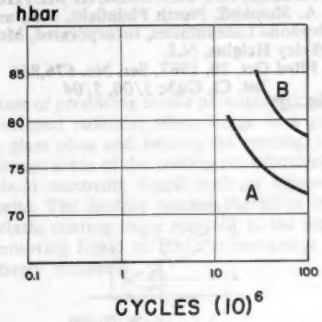
$$(i) \quad \frac{\text{Chromium content}}{\text{Nickel content}} = 3.8\text{–}6.25\%$$

$$(ii) \quad \frac{\text{Nickel content} + 200 \times \text{nitrogen content}}{\text{Chromium content}} = 0.74\text{–}3.72\%$$

and wherein when the said formulae are plotted on a graph with Formula *i* plotted against the X axis and Formula ii plotted against the Y axis, the values of the two formulae taken together fall within that area of the graph bounded by four straight lines extending between points A, B, C and D of the graph respectively having the following co-ordinates:

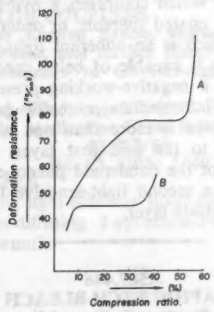
	X	Y
A	3.8	3.72
B	6.25	2.96
C	6.25	1.1
D	3.8	0.74

3,567,435
HIGH STRENGTH STEEL CONTAINING CHROMIUM AND SULFUR
Jacques Moanot, Albertville, France, assignor to Ugine Kuhlmann, Paris, France
Filed Nov. 24, 1967, Ser. No. 685,486
Claims priority, application France, Nov. 24, 1966, 84,767
Int. Cl. C22c *39/14*
U.S. Cl. 75—126 4 Claims



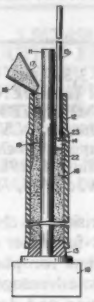
An improved steel containing 0.05 to 0.40 percent sulfur which has a hardness greater than 50 Rockwell C, good machinability and high fatigue strength and is particularly suited for bearings, gears, etc. which are subject to repeated stresses.

3,567,436
COMPRESSION RESISTANT ZINC BASE ALLOY
Takehiro Isobe, Bandai-machi, and Hisanori Iga, Tokyo-to, Japan, assignors to Nisso Kinzoku Kabushiki Kaisha, Tokyo-to, Japan
Filed Apr. 26, 1968, Ser. No. 724,376
Claims priority, application Japan, May 11, 1967, 42/29,543
Int. Cl. C22c *17/00*
U.S. Cl. 75—178 13 Claims



Zinc base alloy consisting of, by weight, 2–25% of aluminium, 1–10% of copper, 0.01–1.5% of magnesium, 0.02–0.15% of beryllium, 0.01–1.5% of titanium, and zinc for the balance has superior compression resistance extending to 110 kg./mm.² of compressive strength and 78 kg./mm.² of yield point on compressive deformation.

3,567,437
METHOD FOR FORMING POROUS SEAMLESS TUBING
Lambert H. Mott, Farmington, Conn. (272 Huyshope Ave., Hartford, Conn. 06114)
Filed May 16, 1968, Ser. No. 729,696
Int. Cl. B22f *3/04*
U.S. Cl. 75—214 2 Claims



Metal powder is poured into a vertical flexible tubular mold containing a central core rod and a spacer slightly larger in diameter than the tubular mold and sliding on the core rod, the spacer is pulled upward through the tubular mold to evenly space powder about the core rod, the ends of the tubular mold are stopped, the tubular mold with powder and core rod therein is placed in a fluid and subjected to high pressure to compact the powder, the tubular mold and core rod are removed, and the metal powder is sintered to form a length of porous seamless tubing.

3,567,438
ORGANIC PHOTOCONDUCTORS SENSITIZED WITH PYRYLIUM CYANINE DYES
Leslie G. S. Brooker, Donald W. Heseltine, and Daniel S. Daniel, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Filed Mar. 25, 1968, Ser. No. 715,520
Int. Cl. G03g *13/22, 5/08*
U.S. Cl. 96—1.6 20 Claims

Pyrylium dyes are provided which feature a 2-arylindole nucleus, a carbazole nucleus, or an imidazo[4,5-b]-quinoxaline nucleus. Organic photoconductors are sensitized with the novel dyes of this invention.

3,567,439
BORINIUM DYES AS SENSITIZERS FOR ORGANIC PHOTOCONDUCTORS
Daniel S. Daniel and Donald W. Heseltine, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Filed Sept. 23, 1968, Ser. No. 761,860
Int. Cl. G03g *5/08, 13/22*
U.S. Cl. 96—1.6 5 Claims

Novel methine dyes are provided which feature a 1,3,2-dioxaborinium salt moiety, 1,3,2 - oxazaborinium salt moiety or a 1,3,2-diazaborinium salt moiety. Organic photoconductors are spectrally sensitized with the novel dyes of this invention. Novel intermediates and methods for the preparation of such intermediates are also provided.

3,567,440
ELECTROPHOTOGRAPHIC MATERIAL
Horst H. J. Kosche, Duren, Germany, assignor to Renker-Belipa GmbH., Duren, Germany
No Drawing. Filed Mar. 22, 1967, Ser. No. 625,033
Int. Cl. G03g *5/04;* H01l *15/00*
U.S. Cl. 96—1.8 3 Claims

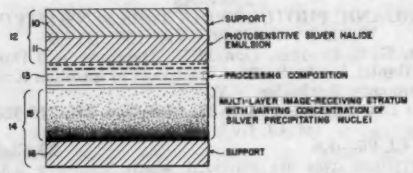
In an electrophotographic material a photoconductive preparation comprising photoconductive reaction prod-

ucts of (i) one or more compounds of at least one di- or polyfunctional isocyanate, and at least one non-photoconductive organic substance, the photoconductive compounds having a plurality of free isocyanate groups linked to aromatic or heterocyclic ring systems and/or conjugated unsaturated aliphatic systems, and (ii) at least one pigment-like or crystalline compound selected from the group consisting of zinc oxide, titanium oxide, zinc sulfide, and cadmium sulfide.

3,567,441
PHOTOGRAPHER HARDENER-DEVELOPER COMPOSITIONS
Howard W. Vogt, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Filed Jan. 4, 1968, Ser. No. 695,564
Int. Cl. G03c *7/16, 7/00, 5/30*
U.S. Cl. 96—22 **23 Claims**

Compositions comprising a chelate compound inorganic developing agent for silver halide and an organic aldehyde hardening agent for photographic hydrophilic colloid layers are used to advantage to combine in a single process step the hardening and developing steps in color processes.

3,567,442
NOVEL PHOTOGRAPHIC PRODUCTS AND PROCESSES
Edwin Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Continuation of application Ser. No. 858,454, Dec. 9, 1959. This application Mar. 10, 1967, Ser. No. 622,133
Int. Cl. G03c *5/54*
U.S. Cl. 96—29 **3 Claims**

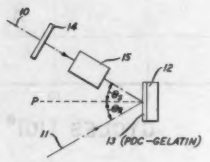


The present invention is directed to a silver diffusion transfer photographic process print-receiving element which comprises a common support carrying on one surface a plurality of layers each of which comprises metallic sulfide, metallic selenide, colloidal metal, thiooxalate or thioacetamide silver precipitating agents disposed in a gelatin, deacetylated chitin or silica matrix wherein each such layer comprises a substantially constant concentration of silver precipitating agent per unit area, and a decreasing concentration, layer-wise, in the direction of the support; and to photographic silver diffusion transfer processes employing such print receiving element.

3,567,443
DIFFUSION TRANSFER PRODUCTION OF PRINTING PLATES WITH LiOH AS ALKALIZING AGENT
Louis Maria De Haes, Edegem, Belgium, assignor to Gevaert Photo-Producten N.V., Mortsel, Belgium
No Drawing. Continuation-in-part of application Ser. No. 296,096, July 18, 1963. This application Aug. 15, 1967, Ser. No. 660,591
Claims priority, application Belgium, July 18, 1962, 41,833
Int. Cl. G03c *5/54*
U.S. Cl. 96—29 **2 Claims**

In the production of planographic printing plates by means of the silver complex diffusion transfer process, an increased number of such printing plates can be produced with the otherwise convention diffusion transfer processing liquid by employing as the alkaline component of that liquid lithium hydroxide in a concentration of about one-half to one mol per liter. The printing plate is formed of metal participating in the chemical reduction of complexed silver halide which diffuses during the diffusion transfer process, and aluminum sheets are preferred.

3,567,444
HOLOGRAPHIC RECORDING METHOD
Theodore A. Shankoff, North Plainfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill and Berkeley Heights, N.J.
Filed Oct. 20, 1967, Ser. No. 676,866
Int. Cl. G03c *5/00, 5/04*
U.S. Cl. 96—27 **7 Claims**



This disclosure relates to a holographic recording method which uses a sensitized gelatin film as the recording medium, and which employs a critical film-development step in processing.

3,567,445
PRESENSITIZED LITHOGRAPHIC PLATE WITH TWO DIFFERENTIALLY SPECTRALLY SENSITIZED LAYERS SEPARATED BY A NOVOLAK RESIN
Lawrence Atkinson, Leonard Roy Brooker, and Brian Ronald David Whitear, Ilford, Essex, England, assignors to Polychrome Corporation, Yonkers, N.Y.
No Drawing. Filed Oct. 20, 1967, Ser. No. 676,713
Claims priority, application Great Britain, Oct. 28, 1966, 48,491/66
Int. Cl. G03f *7/02*
U.S. Cl. 96—33 **14 Claims**

The application describes a composite presensitised lithographic plate which comprises a hydrophilic-surface support base and coated thereon, in order, a first light-sensitive layer which is an adherent light-sensitive layer of the type which is capable of being used as the light-sensitive layer in a negative-working presensitised lithographic plate, an intermediate protective layer or layers, the layer or if there is more than one layer, the layer which is nearest to the said first layer, being a non-hardenable resin of the condensed phenol-carbonyl compound type, and a second light-sensitive layer which is a silver halide emulsion layer.

3,567,446
PHOTOGRAPHIC ETCH-BLEACH BATHS
John M. Gleadle, Prestwood, Great Missenden, England, assignor to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Filed May 1, 1967, Ser. No. 634,850
Int. Cl. G03c *5/00, 5/32*
U.S. Cl. 96—36 **3 Claims**

A process for gelatin relief images is described, comprising bathing the exposed and developed silver halide emulsion in an etch bleach bath. The etch bleach bath contains hydrogen peroxide, cupric ions, halide ions and at least 50 grams per liter of urea.

3,567,447
PROCESS FOR MAKING MASKS PHOTOGRAPHICALLY

Nirmal Chand, South Burlington, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed July 3, 1967, Ser. No. 650,804
Int. Cl. G03c 5/00
U.S. Cl. 96—36 21 Claims

A process of producing masks photographically by forming a developed colloidal silver image in a gelatin coating on a glass plate and heating the coating, after which the non-image areas of the coating are selectively removed by a gelatin removing liquid such as aqueous sodium hypochlorite. The heating renders the silver image areas of the gelatin coating more resistant to the action of the gelatin removing liquid so that the non-image areas may be selectively removed.

3,567,448
IMAGE-FORMING PROCESS UTILIZING A COLORED COMPLEX OF TITANIUM DIOXIDE

Paul B. Gilman, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Nov. 4, 1968, Ser. No. 773,355
Int. Cl. G03c 1/10, 7/00
U.S. Cl. 96—53 9 Claims

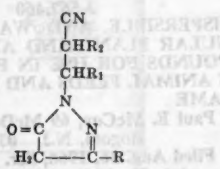
Utilizing the silver-dye-bleach process, photographic dye images are prepared on imagewise exposed photographic elements having, as the light-sensitive component, a colored complex of titanium dioxide and an unsaturated organic ligand compound including at least one nitrogen-containing linkage. A silver metal image is first physically developed on the exposed areas of such an element, after which a bleaching step reduces the colored complex to a colorless form in those areas having a silver image, thereby preparing positive, colored photographic dye images.

3,567,449
SILVER HALIDE PHOTOGRAPHIC COLOUR MATERIAL CONTAINING 1-(CYANOALKYL)-PYRAZOLONE COLOR COUPLERS

Hector Alfons Vanden Eynde, Mortsel, Robert Joseph Pollet, Berchem, and Arthur Henri De Cat, Mortsel, Belgium, assignors to Gevaert-Agfa N.V., Mortsel, Belgium

No Drawing. Filed Aug. 31, 1967, Ser. No. 664,644
Claims priority, application Great Britain, Sept. 26, 1966, 42,823/66
Int. Cl. G03c 1/40
U.S. Cl. 96—56.5 4 Claims

Photographic light-sensitive silver halide elements containing a non-diffusing 2-pyrazolin-5-one color coupler having the formula



wherein R_1 is hydrogen, an alkyl group or an aryl group and R_2 is hydrogen or an alkyl group, and R represents an alkyl group, and aryl group, a heterocyclic group, a —NH-aryl group, a —NH—CO-alkyl group, a —NHCO-aryl group, a —NH—CO-aralkyl group, a—NHCONH-alkyl group, a —NHCONH-aryl group, a —NHCONH-aralkyl group, an alkoxycarbonylamino group, an aryloxycarbonylamino group, or an aralkyloxycarbonylamino group is described. These photographic elements have improved light stability and possess favorable spectral and sensitometric properties.

3,567,450
PHOTOCONDUCTIVE ELEMENTS CONTAINING SUBSTITUTED TRIARYLAMINE PHOTOCONDUCTORS

Thomas B. Brantly, Lawrence E. Contois, and Charles J. Fox, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Feb. 20, 1968, Ser. No. 706,800
Int. Cl. G03g 5/06, 13/22
U.S. Cl. 96—1.5 17 Claims

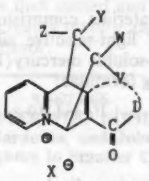
Triarylamines having at least one of the aryl radicals substituted by either a vinyl radical or a vinylene radical having at least one active hydrogen-containing group are good organic photoconductors in electrophotographic systems.

3,567,451
PHOTOSENSITIVE COMPOSITIONS AND ELEMENTS USING DIELS-ALDER ADDUCTS OF QUINOLIZINIUM SALT DERIVATIVES

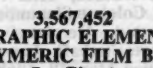
Douglas G. Borden, Donald L. Fields, and Jerry B. Miller, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed June 14, 1967, Ser. No. 645,880
Int. Cl. G03c 1/94
U.S. Cl. 96—86 17 Claims

Photosensitive compositions and elements comprising Diels-Alder adducts having generic formula:



where $X^{\ominus}$ is an anion; D represents the atoms necessary to form a 5 or 6 membered ring, said atoms in D containing an



group, each of V, W, Y and Z separately being hydrogen, alkyl, aryl, cyano, alkylthio, alkoxy, dialkylamino or aralkyl, provided no more than one of V, W, Y and Z is cyano; Y and Z when taken together being alkylenedioxy or V, W, Y and Z when taken together being the atoms or chemical bonds necessary to form a 5 or 6 membered fused ring.

3,567,452
PHOTOGRAPHIC ELEMENT WITH POLYMERIC FILM BASE

Stokes Smith Rawlins, Jr., Piscataway, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed May 7, 1968, Ser. No. 727,333
Int. Cl. G03c 1/78
U.S. Cl. 96—87 2 Claims

A film element comprising a dimensionally stable hydrophobic macromolecular organic polymer film base bearing on at least one surface a non-tacky layer of a mixture of a vinylidene chloride/alkyl acrylate/itaconic acid terpolymer and a polymer of ethyl acrylate or meth-

acrylate and a cross-linking di-ethenyl or di-propenyl monomer subsequently formed in the presence of the terpolymer. Aqueous coating dispersions containing the mixture of terpolymer and cross-linked polymer.

Photographic elements having a water-permeable colloid silver halide layer on a support coated first with the non-tacky layer then overcoated with gelatin.

3,567,453

LIGHT SENSITIVE COMPOSITIONS FOR PHOTORESISTS AND LITHOGRAPHY

Douglas G. Borden, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Dec. 26, 1967, Ser. No. 693,168
Int. Cl. G03c *1/54, 1/94*
U.S. Cl. 96—91 **12 Claims**

A radiation sensitive compound comprises a tetrasubstituted borate anion and an organic cation containing an atom selected from the group consisting of nitrogen, arsenic, tin, antimony, sulfur, iodine, phosphorus, oxygen, titanium, palladium, chromium and cobalt. These compounds can be spectrally sensitized and can be used in photoresists and for lithography.

3,567,454

LIGHT-SENSITIVE MATERIALS

Jozef Frans Willems, Wilrijk, Robrecht Julius Thiers, Brasschaat, and Adam Marcel Schouwenaars, Edegem, Belgium, assignors to Gevaert-Agfa N.V., Mortsel, Belgium

No Drawing. Filed Nov. 21, 1967, Ser. No. 684,622
Claims priority, application Great Britain, Dec. 12, 1966, 55,445/66
Int. Cl. G03c *1/34*
U.S. Cl. 96—109 **7 Claims**

Photographic materials comprising a support and at least one layer of light-sensitive silver halide emulsion containing a water-soluble mercury(II) compound having one of the following formulae:

$$[MO_3S{-}X_1{-}S{-}]_2Hg \qquad MO_3S{-}X_2{-}S{-}Hg{-}Y$$
$$\text{I} \qquad\qquad \text{II}$$

wherein:

X_1 is a bivalent organic radical,
X_2 stands for an aliphatic or aromatic bivalent group,
M represents hydrogen, alkali metal, alkaline earth metal, ammonium, guanidine or an organic amine, and
Y stands for an aliphatic, alicyclic, aromatic or heterocyclic radical, said radicals including the substituted derivatives thereof

are described. The photographic material has improved stability and fogging characteristics.

3,567,455

PHOTOGRAPHIC GELATINE LAYERS WITH PLASTICIZERS

Eckart Seelig, Leverkusen, Fritz Nittel and Wolfgang Himmelmann, Cologne-Stammheim, and Karl-Otto Meyer, Leverkusen, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Mar. 19, 1968, Ser. No. 714,334
Claims priority, application Germany, Mar. 25, 1967, A 55,263
Int. Cl. G03c *1/38, 1/02*
U.S. Cl. 96—114.4 **9 Claims**

Gelatine, especially in photographic gelatine layers, is plasticized with a water-insoluble, dispersed amide, urethane or carbonate having the formula

$$R_1{-}Z{-}O{-}(CH)_n{-}\overset{R}{\underset{}{C}}{-}\overset{O}{\underset{}{C}}{-}X$$

as defined below.

3,567,456

PHOTOGRAPHIC DIRECT-REVERSAL EMULSIONS

Oskar Riester, Leverkusen, Wolfgang Lassig, Cologne-Stammheim, and August Randolph, Leverkusen, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 29, 1967, Ser. No. 686,574
Claims priority, application Germany, Dec. 1, 1966, A 54,235; Apr. 12, 1967, A 55,427
Int. Cl. G03c *1/12*
U.S. Cl. 96—123 **18 Claims**

This invention relates to photographic direct-positive emulsions which are sensitized by certain bis-thiazolyl- or selenazolyl-compounds or by a supersensitizing mixture of the said compounds with certain indole polymethine dyes.

3,567,457

SILVER HALIDE EMULSIONS SENSITIZED WITH PHOSPHOCYANINE DYES

John A. Ford, Jr., Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Oct. 9, 1967, Ser. No. 673,923
Int. Cl. G03c *1/08*
U.S. Cl. 96—142 **10 Claims**

1-indenylidenetriarylphosphorane is a class of stable phosphorus ylides which react with appropriate electrophilic reagents to form various dyes. Some of the dyes are useful spectral sensitizers in silver halide emulsions.

3,567,458

PHOTOGRAPHIC EMULSION CONTAINING A WATER-SOLUBLE ALKYLENE OXIDE BLOCK COPOLYMER AND A MEROCYANINE DYE

Kirby M. Milton, Fishers, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Nov. 15, 1967, Ser. No. 683,107
Int. Cl. G03c *1/10*
U.S. Cl. 96—132 **18 Claims**

Photographic emulsions are provided which contain a water-soluble alkylene oxide block copolymer and carboxy-substituted merocyanine dyes.

3,567,459

SIMULATED BONE COMPRISING SUGAR SOLIDS IN A MOLTEN-THIXOTROPIC THERMOSETTING FORM

Philip J. Wruk, 111 Spoonwood Road, Wilton, Conn. 06897; Philip Roemer, Battle Creek, Mich. (17 Columbus Drive, Carmel, N.Y. 10512); and Peter Q. Van Middlesworth, Rte. 1, Climax, Mich. 49034

No Drawing. Filed July 12, 1967, Ser. No. 652,680
Int. Cl. A23j *1/12;* **A23k** *1/00*
U.S. Cl. 99—2 **11 Claims**

A simulated dog bone is formed from a molten thixotropic thermo-setting sugar composition that includes nutritional fillers, fatty flavoring materials and fat-absorbing farinaceous ingredients wherein the simulated dog bone composition upon cooling solidifies to a hard and non-brittle product.

3,567,460

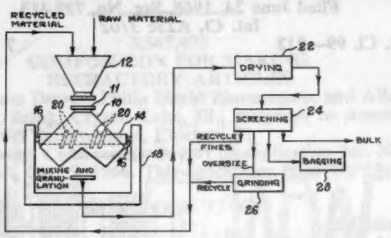
SOIL DISPERSIBLE AND WATER DISPERSIBLE GRANULAR PLANT AND ANIMAL NUTRIENT COMPOUNDS FOR USE IN FERTILIZERS AND/OR IN ANIMAL FEEDS AND METHOD OF MAKING SAME

Paul E. McCoy, 69 McDougall Lane, Bogota, N.J. 07603

Filed Aug. 26, 1968, Ser. No. 755,207
Int. Cl. A23k *1/00;* **C05f** *5/00*
U.S. Cl. 99—2 **28 Claims**

Soil dispersible and water dispersible, granular, plant and animal nutrient compounds for use in fertilizers and/or in animal feeds wherein a plurality of fines of the mi-

cronutrients are entrapped together with a gas in an outer coating of water soluble material such as a polysaccharide; the granular, nutrient compounds being produced by mixing fines of the nutrients with a nonsolid, water soluble material for appropriate times at appropriate temperatures.



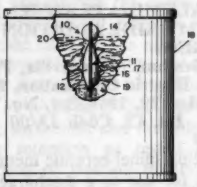
3,567,461
DIETETIC LOW PROTEIN BREAD MIX AND BREAD PRODUCED THEREFROM
Donald A. Wernecke, Minneapolis, Minn., assignor to General Mills, Inc.
No Drawing. Continuation-in-part of application Ser. No. 701,056, Jan. 29, 1968. This application May 28, 1969, Ser. No. 828,726
Int. Cl. A21d *13/06*
U.S. Cl. 99—90 **3 Claims**

A dietetic low protein bread mix comprised of fat, sugar, wheat starch containing wheat gluten, and a structure enhancer added to the mix to produce a low protein content bread having a structure, taste, and appearance similar to that of conventional white bread.

3,567,462
METHOD FOR PRESERVING FRESH ANIMAL TISSUE
Gerald Silverman, Brookline, and George T. Michael, Marshfield, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.
No Drawing. Filed Jan. 26, 1967, Ser. No. 611,847
Int. Cl. A23b *1/00, 3/00*
U.S. Cl. 99—157 **9 Claims**

A method for extending the storage life of frseh animal tissue at refrigeration temperatures is disclosed. The animal tissue is subjected to radio pasteurization and stored in an atmosphere from about 30 percent carbon dioxide to 100 percent carbon dioxide at refrigeration temperatures. The pasteurization of tissue can precede, follow, or interrupt the carbon dioxide step and the storage atmosphere preferably contains at least 70 percent carbon dioxide.

3,567,463
FOOD FLAVORING PACKET FOR CONTAINERS
Theodore M. Williams, 816 N. Ridgewood Ave., Daytona Beach, Fla. 32014
Filed Feb. 6, 1969, Ser. No. 796,984
Int. Cl. B65d *81/32*
U.S. Cl. 99—171 **8 Claims**



A packet containing a food flavoring buoyantly supported in the liquid of a food container packaged for sale to a consumer, so that the packet will be readily accessible for removal when the container is opened, to be utilized for flavoring the food contents of the container.

3,567,464
METHOD FOR PREPARING A REASSEMBLED UNITARY MEAT PRODUCT
Edd O. Stallons, Westchester, Ill., assignor to Armour and Company, Chicago, Ill.
No Drawing. Filed Mar. 24, 1967, Ser. No. 625,611
Int. Cl. A22c *18/00*
U.S. Cl. 99—107 **3 Claims**

This invention relates to a new reassembled unitary meat product and method for preparing the same from an individual piece or pieces of meat. The process generally comprises the steps of scoring pieces of meat to a depth substantially below their surface, holding the meat for a sufficient time to permit the release of meat juices and to increase the adhesiveness of the juices, rescoring the portion of the meat previously scored, and pressing the meat together into the desired form of the meat product until the meat is bound together as one cohesive mass.

3,567,465
PROCESS OF MAKING SUNFLOWER SEED PASTE
Herbert B. Knechtel, Park Ridge, Ill., assignor to Dahlgren & Company, Inc., Crookston, Minn.
Filed Apr. 15, 1968, Ser. No. 721,290
Int. Cl. A23l *1/36*
U.S. Cl. 99—134 **1 Claim**

A sunflower seed paste spread and process of making the same wherein a predetermined amount of sunflower seed meats are heated in a predetermined volume of melted sugar to cause the sunflower seed meats to become roasted. An additional quantity of sunflower seed meats is then roasted in oil, and the oil is drained therefrom, and the oil roasted seed meats are then admixed with said mixture of roasted sunflower seed meats and syrup. The mixture is then cooled and pulverized to form a paste which has a creamy texture and a pleasant savory sunflower seed meat flavor.

3,567,466
EMULSIFIER FOR FOODSTUFF
Ralph B. Fearing, Bardonia, and John C. Sourby, Hawthorne, N.Y., assignors to Stauffer Chemical Company, New York, N.Y.
No Drawing. Filed June 11, 1968, Ser. No. 735,991
Int. Cl. A23g *3/00;* **A23l** *1/24*
U.S. Cl. 99—139 **5 Claims**

An emulsifying agent for oil and water foodstuff combinations consisting essentially of a phosphate composition having the following formula:

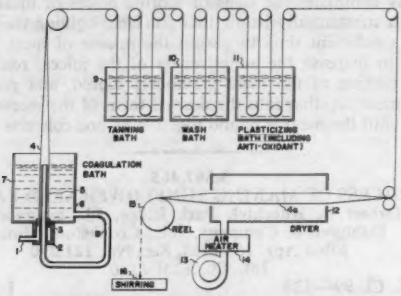
$$\left[R{-}O{-}\underset{\underset{(OH)_m}{|}}{\overset{\overset{O}{\|}}{P}}{-}O{-}R_1{-}A\right]_q$$

wherein R is a straight chain alkyl group having from 8 to 24 carbon atoms, R_1 is a polyol selected from the group consisting of monoglycerol, diglycerol, triglycerol, tetraglycerol, and mixtures thereof; A is selected from the group consisting of hydrogen, lactyl, dihydroxypropionyl, saccharyl, tartaryl, gluconyl, malyl and mixtures thereof; and n is 1 or 2, m is 0 or 1 and q is 1 or 2.

3,567,467
EDIBLE COLLAGEN CASING CONTAINING ANTIOXIDANT
Mauj A. Cohly, Catlin, Ill., assignor to Tee-Park, Inc.
Filed Jan. 15, 1968, Ser. No. 697,708
Int. Cl. C22c *13/00*
U.S. Cl. 99—176 **10 Claims**

An edible sausage casing prepared from hide collagen having improved antioxidant and appearance character-

istics, and the method of manufacture thereof. Animal hides are swollen and mechanically unhaired and split to produce a collagen containing corium layer. The corium is ground into fine particles, formed into a slurry and swollen with weak acid to produce an extrudable collagen paste or slurry having a solids content of about 2–6%. The slurry is extruded through an annular die, coagulated with ammonium sulfate or sodium sulfate and tanned or hardened in a bath containing any suitable nontoxic tanning agent such as aluminum salts, ferric salts, nontoxic dialdehydes, etc. The tanned casing



is washed and finally plasticized using an aqueous solution of glycerin or equivalent plasticizer, containing a small amount of a monoglyceride or an acetylated monoglyceride, and an edible, nontoxic antioxidant. The casing is then dried and reeled and eventually shirred on a commercial shirring machine for delivery to the meat packer in shirred form. The final treatment of the casing, prior to drying, with the solution containing a small amount of an edible, nontoxic antioxidant, is effective to improve the antioxidant and appearance characteristics of the casing, particularly upon prolonged storage.

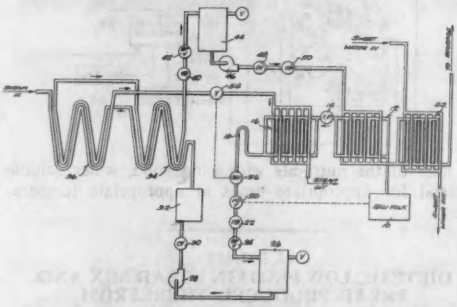
3,567,468
FROZEN FOODS
Donald Kiteley Tressler, 74 N. Compo Road, Westport, Conn. 06880
No Drawing. Filed Dec. 27, 1966, Ser. No. 604,571
Int. Cl. A23b *7/04*
U.S. Cl. 99—193 **10 Claims**

This invention relates to a boil-in-the-bag frozen food package and the method of producing same comprising a sealed heat-resistant container and within said container a frozen comestible and a dry sauce mix, said sauce mix being present in an amount sufficient to use in its constitution to a liquid sauce, the liquid resulting from heating the container in preparation of the contents for consumption.

3,567,469
PROCESS FOR THE PRODUCTION OF DEHYDRATED PRODUCTS
Roberto Calderon-Pedroza and Isabel Resano-Gonzalez, Mexico City, Mex., assignors to CPC International Inc., New York, N.Y.
No Drawing. Filed Dec. 14, 1964, Ser. No. 418,318
Int. Cl. A23b *1/04, 3/04, 7/02*
U.S. Cl. 99—204 **12 Claims**

Edible material is dehydrated by forming a dispersion of finely divided particles of the material in hydrophobic fluid and subjecting the dispersion to reduced pressure in the form of a thin, agitated film. The dispersion does not exceed about 3 millimeters when spread as a thin layer on a heated surface.

3,567,470
MILK STERILIZATION PROCESS
Grover W. McElroy, 1587 Cherry Road, Apt. 1, Memphis, Tenn. 38117
Filed June 24, 1968, Ser. No. 739,413
Int. Cl. A23c *3/02*
U.S. Cl. 99—212 **7 Claims**



A single flow high temperature and short time milk sterilization process in which raw milk is first treated in standard presses of the type normally used for pasteurization and thereafter is passed through counterflow heat exchangers wherein the milk is gradually raised to sterilization temperatures. The milk is vacuum treated after pasteurization and after sterilization and is maintained under pressure while it is passed through the sterilization heat exchangers.

3,567,471
NONSETTLING THIXOTROPIC COLD BOTTOM FILLER COMPOSITION
George F. Kahle, 1600 Long-Valley Road, Glenview, Ill. 60025
No Drawing. Filed May 16, 1967, Ser. No. 638,723
Int. Cl. A43b *13/42;* **C08f** *45/20;* **C09k** *3/00*
U.S. Cl. 106—38 **5 Claims**

A nonsettling thixotropic composition capable of setting to a pliable solid when exposed to the atmosphere and particularly suited for use as a cold bottom filler in the construction of shoes which is formed of a binder material containing a resinous film forming material dissolved in one or more volatile solvents and containing asbestos fiber particles or equivalent inert thickeners and gellants as a thixiotropy producing agent in an amount sufficient to maintain the binder material in a thixotropic state and having solid particulate material, such as granulated cork, uniformly distributed throughout the thixotropic binder material.

The nonsettling thixotropic composition is prepared by first mixing the binder material ingredients to form the thixotropic binder and thereafter uniformly distributing the solid particulate material throughout the thixotropic binder material.

3,567,472
MAGNESIUM-ALUMINATE SPINEL MEMBER HAVING CALCIUM OXIDE ADDITION AND METHOD FOR PREPARING
Raymond J. Bratton, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Mar. 28, 1968, Ser. No. 716,890
Int. Cl. C04b *33/00*
U.S. Cl. 106—39 **5 Claims**

Light-transmitting spinel ceramic member, which is particularly adapted for use as a discharge device arc tube, has added thereto a small amount of calcium oxide. The spinel member is easily sintered and has improved strength and light-transmission properties. In the method for preparing such a member, a small amount of calcium oxide

is distributed throughout spinel powder, the mixture is compacted, and thereafter sintered in accordance with a predetermined schedule.

3,567,473
COMPOSITION FOR MAKING REFRACTORY ARTICLES

James Ross Drever, Philip David Zimmerman, and Allan Blaine Brink, Crystal Lake, Ill., assignors to Amsted Industries Incorporated, Chicago, Ill.

No Drawing. Continuation-in-part of application Ser. No. 584,365, Oct. 5, 1966. This application May 14, 1968, Ser. No. 728,922

Int. Cl. C04b *35/48*

U.S. Cl. 106—57 **12 Claims**

The refractory composition includes a fusion product as well as tabular alumina, calcined alumina, alpha quartz, and a relatively small quantity of magnesium oxide, all of which ingredients are processed with a colloidal silica solution. The tabular alumina and alpha quartz may be replaced by kyanite. The fusion product may include unstabilized monoclinic zirconia and alumina alone or may comprise zirconia, alumina and either silica or magnesium oxide.

3,567,474
TREATMENT OF CLAY

Peter James Malden, Cornwall, England, assignor to English Clays Lovering Pochin & Company Limited, St. Austell, Cornwall, England

No Drawing. Filed Aug. 6, 1968, Ser. No. 750,474

Claims priority, application Great Britain, Aug. 11, 1967, 37,122/67

Int. Cl. C08h *17/06;* **C09c** *1/42*

U.S. Cl. 106—72 **5 Claims**

A mineral having a layer lattice crystal structure, for example a clay mineral, is bleached by first forming an intercalation complex with, for example, urea and thereafter bleaching the intercalation complex with an oxidising bleaching agent.

3,567,475
ASPHALT SOLUTIONS AND METHODS FOR APPLYING THE SAME

Fritz S. Rostler, Berkeley, Calif., assignor to Witco Chemical Company, Inc., New York, N.Y.

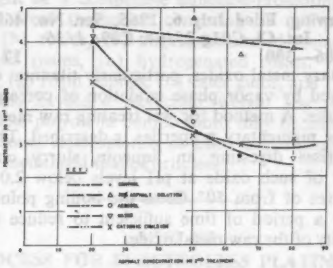
Continuation-in-part of application Ser. No. 366,574, May 11, 1964, which is a continuation-in-part of application Ser. No. 274,193, Apr. 19, 1963, now Patent No. 3,162,101, and also is a continuation-in part of applications Ser. No. 366,568, May 11, 1964, which is a division of application Ser. No. 274,193, Apr. 19, 1963, which in turn is a continuation-in-part of abandoned applications Ser. No. 45,023, July 25, 1960, and Ser. No. 254,399, Jan. 28, 1963, which also in turn are continuations-in-part of abandoned application Ser. No. 497,397, Mar. 28, 1955. This application Aug. 26, 1966, Ser. No. 575,466

Int. Cl. C08h *13/00, 17/22*

U.S. Cl. 106—278 **16 Claims**

An asphalt solution for treating uncemented sands, soils and aggregates to consolidate the same, which solution contains a light petroleum oil fraction having a boiling point lower than that of light gas oil and from 10–80% by weight of a gel type asphalt. The gel type asphalt has an R ratio of about 0.8 to about 1.2 and has a penetration of 60–100 at 77° F. (ASTM D–5). The asphalt solution contains a cationic surfactant and the solution has a 95% minimum coating retention as tested by ASTM test D–1664. The method of treating bodies of uncemented sand, soils and aggregates to consolidate them, which method involves applying to the surface of the bodies an asphalt solution as defined above.

The method of treating bodies of uncemented sands, soils and aggregates to consolidate them. First, there is applied to the surface a solution of a light petroleum oil fraction having a boiling point lower than that of light gas oil and containing from 10 to 30% by weight of a gel type asphalt having a penetration of 60–100 at 77° F. (ASTM D–5), an R ratio of from about 0.8 to about 1.2, and containing a cationic surfactant. The solution has a 95% minimum coating retention as tested by ASTM test D–1664 at a rate of application of about 0.2 to about 1 gallon per square yard of surface being treated. Follow-



ing the first treatment, there is applied to the surface a light petroleum oil (as defined above) solution containing 50–70% by weight of a gel type asphalt having a penetration of 60–100 at 77° F. (ASTM D–5), an R ratio of from about 0.8 to about 1.2 and containing a cationic surfactant. The asphalt solution has a 95% minimum coating retention as measured by ASTM test D–1664, and the second application is made at a rate of from about 0.5 to about 2 gallons per square yard of the surface being treated.

3,567,476
METHOD OF COLORING BITUMINOUS MATERIALS AND THE RESULTING PRODUCT

Philip X. Masciantonio, Penn Township, Westmoreland County, and Richard C. Weil and Myron H. Wilt, Monroeville, Pa., assignors to United States Steel Corporation

Continuation-in-part of application Ser. No. 515,668, Dec. 22, 1965. This application Apr. 4, 1969, Ser. No. 822,807

Int. Cl. C08h *13/00;* **C08k** *1/62;* **C09d** *3/24*

U.S. Cl. 106—277 **5 Claims**

A method is disclosed for coloring a liquid bituminous material which is normally black. The liquid bituminous material is mixed with a filler (e.g., montmorillonite clay). Separately a protective colloid emulsifying agent is mixed with hot water. The two mixtures are combined in a colloid mill to form a water emulsion of the bituminous material. Next a clay masking agent is mixed with the emulsion. Finally a resinous substance (e.g., latex) and a pigment are mixed with the emulsions. The resinous substance and pigment coat the individual masked colloidal particles of bituminous material.

3,567,477
MOLYBDATE ORANGE PIGMENT

James F. Higgins, Livingston, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Nov. 15, 1967, Ser. No. 683,119

Int. Cl. C09c *1/20*

U.S. Cl. 106—298 **7 Claims**

A high strength molybdate orange pigment, characterized by the typical X-ray diffraction pattern for molybdate orange and containing from 4 to 9 mol percent of lead molybdate, from 1 to 7 mol percent of lead sulfate and no more than 25 mol percent of monoclinic lead chromate, based on the total mols of lead salts present,

prepared by introducing a chromate-molybdate-sulfate solution through a jet at a linear velocity of at least 48 ft./sec. into a stirred lead salt solution.

3,567,478
PROCESS FOR IMPROVING PIGMENTARY METAL OXIDES
Albert Dietz, Wadsworth, and Harry Lott, Jr., Akron, Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.
No Drawing. Filed July 6, 1965, Ser. No. 469,864
Int. Cl. C01g *23/04;* C09c *1/36*
U.S. Cl. 106—300 **17 Claims**

Pigmentary metal oxides, particularly titanium dioxide, are prepared by vapor phase oxidation of corresponding metal halides. A method for wet treating raw metal oxide to improve pigmentary properties is described. The process comprises digesting an aqueous slurry consisting essentially of such oxide at pH levels below 2.0 and at temperatures of from 50° C. to the boiling point of the slurry for a period of time sufficient to reduce the surface activity of the raw metal oxide.

3,567,479
PRODUCTION OF AQUEOUS SUSPENSIONS OF TITANIUM DIOXIDE
Pierre J. Portes, Jacques Andre Krisner, and Robert Jean Mas, Thann, France, assignors to Fabriques de Produits Chimiques de Thann et de Mulhouse, Thann, France
No Drawing. Filed Feb. 9, 1968, Ser. No. 704,274
Claims priority, application France, Feb. 17, 1967, 95,435
Int. Cl. C09c *1/36, 3/02*
U.S. Cl. 106—300 **3 Claims**

Aqueous suspensions of titanium dioxide are obtained using as dispersing agent a mixture of an alkali metal salt, especially a phosphate or polyphosphate, and an amine, especially an ethanolamine. The respective amounts of the two components may be 0.5–3%, and 0.05–2%, on the weight of the titanium dioxide. The dispersion can be hydroclassified without use of a flocculating agent.

3,567,480
PIGMENT OR FILLER AND MATERIALS AND PROCEDURES FOR MAKING THE SAME
William L. Craig, Westport, Conn., assignor to R. T. Vanderbilt Company, Inc., New York, N.Y.
Original application Mar. 29, 1965, Ser. No. 447,116. Divided and this application June 11, 1969, Ser. No. 850,283
Int. Cl. C01g *23/04;* C09c *1/36*
U.S. Cl. 106—300 **12 Claims**

A complex composition consisting essentially of TiO_2, SiO_2 and CaO made by precipitation from an acid solution of titanyl sulfate containing calcium and silicate ions dissolved therein, by mixing such solution with an alkaline solution under conditions of high shear.

3,567,481
FIBROUS CATIONIC MINERAL PIGMENT
William L. Craig, Westport, Conn., assignor to R. T. Vanderbilt Company, Inc., New York, N.Y.
No Drawing. Filed June 5, 1968, Ser. No. 734,581
Int. Cl. C09c *1/02, 3/00*
U.S. Cl. 106—306 **8 Claims**

An improved complex silicate pigment is disclosed prepared by precipitating a complex silicate pigment on cationic fibrous magnesium or magnesium-aluminum silicates. The ratio of the fibrous silicate to pigment is between about 50:50 and 97:3 by weight. The properties of papers manufactured using the improved pigment of this invention are described.

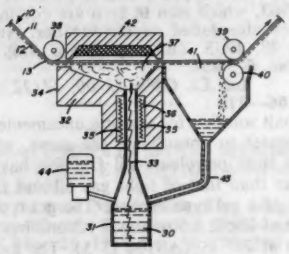
3,567,482
LATENT IMAGE PRINTING DEVICE
Harry O. George, Belle Mead, and James F. Martone, Somerville, N.J., assignors to International Business Machines Corporation, Armonk, N.Y.
No Drawing. Filed Jan. 12, 1968, Ser. No. 697,296
Int. Cl. B44f *1/10*
U.S. Cl. 117—1.7 **2 Claims**

A latent image printing device comprising a substrate, a first layer of abrasive material, and a second layer of non-abrasive material placed as a negative facsimile of the image to be printed upon said first layer, said layers matched for similarity of properties of color, gloss and fluorescence, to render the image undetectable under normal or ultraviolet light. The image is developed by rubbing, for example, a metal object over the surface of said substrate, causing abrading of the object in the abrasive areas and "printing" of said image.

3,567,483
IMAGE DEVELOPMENT SYSTEM
Frederick J. Stryker, San Jose, Calif., assignor to the United States of America as represented by the Secretary of the Army
No Drawing. Filed Mar. 26, 1968, Ser. No. 716,235
Int. Cl. B41m *5/02;* B44d *5/04*
U.S. Cl. 117—1.7 **2 Claims**

An improvement for reproducing onto a copy paper the latent image of an original which has been produced by the Reduced Layer Formation Process (RLF), which comprises treating the original with oleic acid, transferring a latent oil image on the original onto a copy paper and rendering the transferred latent oil image on the copy paper visible.

3,567,484
PROCESS FOR FUSING XEROGRAPHIC IMAGES
William E. White and William F. Garbe, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Mar. 17, 1969, Ser. No. 807,831
Int. Cl. B44d *1/094;* G03g *13/20*
U.S. Cl. 117—17.5 **6 Claims**



A process for fusing an electroscopic toner image to the surface of a support in which the support is moved relative to a station where a nonsolvent vapor is applied to the support. The toner image is fused to the support by the heat released by the exothermic change of state of the vapor due to its contact with the support and toner.

3,567,485

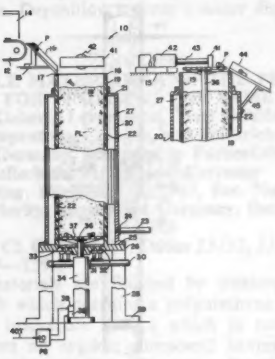
ARTICLE COATING METHOD

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of application Ser. No. 305,002, Aug. 27, 1963, which is a continuation-in-part of applications Ser. No. 589,848, May 28, 1956, and Ser. No. 589,300, June 4, 1956. This application Oct. 14, 1968, Ser. No. 767,377

Int. Cl. B44c *1/08*

U.S. Cl. 117—21 5 Claims



An apparatus and method for coating or otherwise treating the surfaces of small articles by passing the articles through a fluidized medium. In one form, a fluidized bed of particles of thermoplastic coating material is generated by passing a gas upwardly through a column surrounded by a jacket or housing and introducing particles of thermoplastic material into said column which particles become fluidized. Thereafter, articles such as metal parts which have been preheated to a temperature above the melting range of the plastic resin so fluidized, are introduced into the top of the chamber and allowed to fall through the fluidized mass. As they fall, they intersect particles of the fluidized mass which melt upon contact with the surface of the articles forming a coating thereon. Depending upon the height of the column and the desired thickness of coating, the articles may be ejected or carried upwardly by a movable receiving device located at the bottom of the column which is activated to either propel the articles from the surface thereof upwardly into the fluidized mass or to carry the articles upwardly into the fluidized mass.

3,567,486

HEAT-SEALABLE FILM

Timothy Alan Remmington, Hertford, and Auguste Louis Lucien Palluel, Windsor, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Mar. 6, 1967, Ser. No. 620,678

Claims priority, application Great Britain, Mar. 29, 1966, 13,859/66

Int. Cl. C09j *7/02*

U.S. Cl. 117—47 7 Claims

An improved heat sealable film having at least one surface treated to improve its bonding properties and having adhesively bonded thereto a resin coating of a condensation product of a moroaldehyde with an interpolymer of acrylamide or methacrylamide condensed in the presence of alkanol. The interpolymer is a copolymer of acrylamide and methacrylamide and at least one monoethylenically unsaturated monomer. Suitably the monoaldehyde is formaldehyde and the monoethylenically unsaturated monomer is styrene.

3,567,487

METALLIZABLE POLYOLEFINS

Wassily Poppe and Habet M. Khelghatian, Springfield, Pa., assignors to Avisun Corporation, Philadelphia, Pa.

No Drawing. Filed Jan. 6, 1969, Ser. No. 789,422

Int. Cl. B44d *1/92;* C23c *17/00*

U.S. Cl. 117—47 19 Claims

Metallizable polyolefin compositions are provided from blends of a polyolefin and from about 1% to about 55% by weight of a compatible adhesion-promoting modifier selected from the group consisting of (a) polyterpene resins, (b) rosins, (c) disproportionated rosins, (d) polymerized rosins, (e) hydrogenated rosins, (f) dirosin amines, (g) rosin amides, (h) ester gums, and (i) petroleum resins having a molecular weight less than about 3,000. The polyolefin compositions may be metallized by conventional electroplating or other metallizing processes to form metallized shaped articles.

3,567,488

PROCESS FOR ELECTROLESS PLATING OF CARBOXYLIC ACID COPOLYMERS USING AMMONIA

Richard J. Rathsack, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Feb. 5, 1969, Ser. No. 796,892

Int. Cl. B44d *1/92;* C23c *3/02*

U.S. Cl. 117—47 8 Claims

Process for chemically depositing a plating metal on the surface of a copolymer of an α,β-ethylenically unsaturated monocarboxylic acid in which the surface is first ammoniated and then treated with a noble metal salt prior to the chemical deposition.

3,567,489

PROCESS FOR ELECTROLESS PLATING OF CARBOXYLIC ACID COPOLYMERS USING ALKYLENIMINES

Richard J. Rathsack, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Feb. 5, 1969, Ser. No. 796,893

Int. Cl. B44d *1/092;* C23c *3/02*

U.S. Cl. 117—47 8 Claims

Process for chemically depositing a plating metal on the surface of a copolymer of an α,β-ethylenically unsaturated monocarboxylic acid in which the surface is first treated with an alkylenimine and then treated with a noble metal salt prior to the chemical deposition.

3,567,490

FIXTURE FOR MAKING GLASS-TO-METAL SEALS OR THE LIKE AND METHODS OF MAKING THE SAME

Arthur T. Johnson, Providence, R.I., assignor to GTI Corporation

Filed Oct. 4, 1967, Ser. No. 672,919

Int. Cl. B44d *1/14*

U.S. Cl. 117—54 11 Claims

A high temperature ceramic fixture is disclosed for employment in holding metal and glass components in proper position for fusing of glass-to-metal seals therebetween. The life of the fixture and the quality of the glass-to-metal seals are improved by a unique method of depositing a uniformly adherent coating of carbon on the fixture at relatively low temperatures. The carbon-coated ceramic fixture is more durable and its coating can be periodically replenished during usage without the necessity of refiring or replacing the fixtures.

3,567,491
COATING COMPOSITIONS
Paul R. Graham, Ballwin, and August F. Ottinger, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Apr. 3, 1968, Ser. No. 718,378
Int. Cl. D21h *1/40*
U.S. Cl. 117—76 10 Claims

This invention relates to fibrous substrates and the sequential coating thereof with an interpolymer of ethylene, vinyl chloride and acrylamide and polyvinylidene chloride polymer.

3,567,492
METHOD FOR TREATING STONE TO OBTAIN IMPROVED BONDING TO BITUMINOUS MATERIAL
Peter M. Burrill, Cowbridge, Wales, assignor to Midland Silicones Limited, Berkshire, England
No Drawing. Filed June 24, 1968, Ser. No. 739,145
Int. Cl. B44d *1/14*
U.S. Cl. 117—72 5 Claims

A method for bonding a bituminous material to stone surfaces employing an aqueous emulsion of certain organosilicon materials as a primer on the stone. The aqueous emulsion of organosilicon material is applied to the stone and the coating is dried prior to application of the bituminous material thereto.

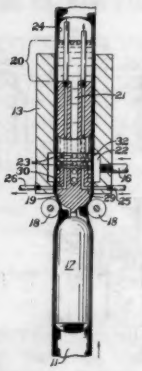
3,567,493
METHOD OF CURING A ROOM TEMPERATURE VULCANIZABLE SILICONE COMPOSITION TO A VULCANIZED SILICONE RUBBER
James K. Wessel, Elizabethtown, Ky., assignor to Dow Corning Corporation, Midland, Mich.
No Drawing. Filed Feb. 19, 1968, Ser. No. 706,673
Int. Cl. B44d *1/14*
U.S. Cl. 117—76 9 Claims

A method of curing a room temperature vulcanizable silicon composition to other cured silicone rubbers by applying a metal carboxylate to the surface of the cured silicone rubber prior to applying the room temperature vulcanizable silicone composition is disclosed. The room temperature vulcanizable silicone composition is a mixture of a hydroxylated organosiloxane polymer, a hydrocarbonoxy silicon compound or a silicon compound having silicon bonded hydrogen atoms, and a curing catalyst. The metal carboxylate can be illustrated by dibutyltindilaurate. This method is useful in sealing, encapsulating and bonding processes where some or all the parts are cured silicone rubber.

3,567,494
PROCESS FOR PREPARING POLYMERIZED SURFACE COATINGS USING ULTRA-VIOLET RADIATION
Chester W. Fitko, Chicago, Ill., assignor to Continental Can Company, Inc., New York, N.Y.
No Drawing Filed Aug. 29, 1968, Ser. No. 756,322
Int. Cl. B44d *1/50*
U.S. Cl. 117—93.31 10 Claims

A process for coating an article wherein there is applied to the surface of the article to be coated a thin film of a polymerizable acrylic ester prepared by the coesterification of a polyhydric alcohol having at least 3 esterifiable hydroxyl groups on adjacent carbon atoms with acrylic acid, and a dicarboxylic acid selected from a saturated aliphatic dicarboxylic acid and an alpha-unsaturated, alpha,beta-dicarboxylic acid, from 45% to 95% of the hydroxyl groups of the alcohol being esterified with the acrylic acid, 5% to 55% of the hydroxyl groups being esterified with the dicarboxylic acid, and exposing the polymerizable film-containing surface to a source of ultraviolet radiation for a time sufficient to effect polymerization of the acrylic ester film.

3,567,495
METHOD FOR LINING A PREFORMED PERMEABLE TEXTILE TUBE
Leslie B. Gajdos, Lakewood, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.
Continuation-in-part of application Ser. No. 372,309, June 3, 1964. This application Sept. 5, 1968, Ser. No. 770,465
Int. Cl. B05b *13/06;* B05c *7/04, 8/04*
U.S. Cl. 117—95 4 Claims



A permeable textile tube containing a unique floating mandrel is interiorly coated by passing a plastisol through the textile tube, and through the interior of the mandrel to a coating zone atop the mandrel. An exterior coat is then optionally given to the tube.

3,567,496
METHOD OF PRODUCING PLASTIC IMPREGNATED CONCRETE
Meyer Steinberg, Huntington Station, Peter Colombo, Patchogue, Lawrence E. Kukacka, Port Jefferson, and Bernard Manowitz, Brightwaters, N.Y., assignors to the United States of America as represented by the United States Atomic Energy Commission
No Drawing. Filed Aug. 9, 1968, Ser. No. 751,338
Int. Cl. C04b *41/28;* C05c *3/02*
U.S. Cl. 117—113 4 Claims

A method of improving the physical properties of concrete bodies comprising impregnating the body with a mixture of monomer and polymerization catalyst and thereafter thermo-catalytically polymerizing the monomer in situ.

3,567,497
FABRICATING STRUCTURES IMPREGNATED WITH MIXTURES OF VINYLIC RESINS AND ACRYLOXYALKYLSILANES
Edwin P. Plueddemann and Harold A. Clark, both % Dow Corning Corp., Midland, Mich. 48640
No Drawing. Continuation-in-part of application Ser. No. 288,525, June 17, 1963, which is a continuation-in-part of abandoned application Ser. No. 111,146, May 19, 1961, which in turn is a continuation-in-part of abandoned application Ser. No. 87,101, Feb. 6, 1961. This application Nov. 3, 1967, Ser. No. 680,310
Int. Cl. C03c *25/02*
U.S. Cl. 117—126 3 Claims

Method of making molded articles, particularly of fibrous glass, comprising impregnating a substrate with a mixture of a curable vinylic resin and an acryloxyalkylsilane and subsequently curing to form a consolidated article.

3,567,498

METHOD FOR TREATING FABRICS

John W. Rafferty, Marblehead, and Derek E. Till, Concord, Mass., assignors to Arthur D. Little Inc., Cambridge, Mass.

No Drawing. Filed July 7, 1966, Ser. No. 563,399
Int. Cl. D06m *15/16*
U.S. Cl. 117—139.5 4 Claims

A method of enhancing the body of a fabric, particularly after laundering, without increasing its stiffness, by depositing on the fabric up to 3% of its weight a copolymer of ethylene and vinyl acetate, of butylacrylate and acrylamide, or of polybutyl acrylates containing acrylic acid residues. Deposition is from a water dispersion.

3,567,499

TEXTILE MATERIALS AND THE PROCESS FOR FINISHING THE SAME

Wolfgang Klebert, Leverkusen, Karl Schäfer, Opladen, Heinz Griepentrog, Cologne, and Friedrich Reich, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Oct. 4, 1967, Ser. No. 672,718
Claims priority, application Germany, Oct. 6, 1966, F 50,369
Int. Cl. C08g *47/10*; D06m *15/52, 15/66*
U.S. Cl. 117—139.5 8 Claims

Textile materials are finished by treatment with an aqueous bath which contains a polyurethane prepolymer having free isocyanate groups which in turn has been obtained from an organic compound having active hydrogen containing groups and an organic polyisocyanate, and an organo polysiloxane having a molecular weight of to about 25,000 and containing at least two active hydrogen containing groups. The organo polysiloxane is reactive with the isocyanato prepolymer on the textile substrate in order to give the textile material a full pleasantly soft, supple hand and reduce susceptibility to soiling. One may use polymers or copolymers prepared from vinyl or divinyl monomers in the aqueous bath along with the other components.

3,567,500

FLUOROAMIDE-AMINO POLYMERS AND PROCESS FOR IMPARTING OLEOPHOBIC YET HYDROPHILIC PROPERTIES TO FIBROUS MATERIALS

Jerry P. Moreau, New Orleans, and George L. Drake, Jr., and Wilson A. Reeves, Metairie, La., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Apr. 18, 1968, Ser. No. 722,211
Int. Cl. C08j *1/44*
U.S. Cl. 117—139.5 6 Claims

Certain liquid perfluoroalkyl esters were reacted with certain liquid polyamines containing a primary: secondary:tertiary amine ratio of 1:2:1 to produce new liquid polymeric fluoroamido-amino compounds. The new compounds were dissolved in certain solvents and applied to cotton fabrics thereby imparting to the treated fabrics olephobicity with retained hydrophilicity which was durable to repeated laundering.

3,567,501

SOFTENING AND INCREASING ABRASION RESISTANCE OF FABRICS CONTAINING CELLULOSE ETHERS INCORPORATING AMINE GROUPS BY USE OF HETEROCYCLIC CARBONATES

Truman L. Ward and Ruth R. Benerito, New Orleans, La., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Oct. 11, 1968, Ser. No. 766,950
Int. Cl. C08j *1/44*
U.S. Cl. 117—139.5 1 Claim

This invention relates to a process for softening and for increasing abrasion resistance of fabrics. More particularly, this invention relates to a process for softening and for increasing abrasion resistance of fabrics containing cellulose ethers incorporating amine groups by use of heterocyclic carbonates.

3,567,502

BARRIER COATINGS

Paul R. Graham, Ballwin, and August F. Ottinger, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Apr. 3, 1968, Ser. No. 718,367
Int. Cl. D21h *1/40*
U.S. Cl. 117—155 11 Claims

This invention relates to fibrous substrates coated with a mixed latex of polyvinylidene chloride polymer and an ethylene, vinyl chloride and acrylamide interpolymer.

3,567,503

PAPER TREATED WITH COPOLYMER COMPOSITIONS

William Franklin Fallwell, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of application Ser. No. 703,250, Feb. 6, 1968, which is a division of application Ser. No. 411,610, now Patent No. 3,395,131, dated Nov. 16, 1964. This application Sept. 30, 1969, Ser. No. 862,533
Int. Cl. D21h *1/28*
U.S. Cl. 117—155 5 Claims

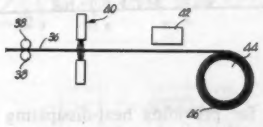
This invention relates to copolymers of a vinyl compound and a partial ester of an unsaturated dibasic acid anhydride and a hydroxyl-contining nonionic dispersing agent and their use as pigment binders in mineral coated paper.

3,567,504

POLYIMIDE BONDED SOLID LUBRICANT BEARING SURFACE

Vernice Hopkins, Overland Park, and Mahlon E. Campbell, Merriam, Kans., and Keith E. Demorest, Huntsville, Ala.; said Demorest assignor to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration, said Hopkins and Campbell assignors to Midwest Research Institute, Kansas City, Mo.

Filed June 19, 1967, Ser. No. 647,007
Int. Cl. C10m *7/00*; F16c *13/02, 19/00*
U.S. Cl. 117—160 16 Claims



A solid lubricant film coating composition is produced by admixing a finely divided solid lubricant material comprising a mixture of molybdenum disulfide (MoS_2) and antimony trioxide (Sb_2O_3) into a solution of a polypyromellitamic acid and a solvent therefor. In particular, the acid is derived from the reaction between pyromellitic dianhydride (PMDA) and either 4,4′-diaminodiphenyl ether (DADPE) or 4,4′-methylene dianiline (MDA). The solvent for the MDA acid is diethylene acidimide while the solvent for the DADPE acid is a three to one volume ratio of oxylene and pyrrolodine. Optimum results are obtained with MDA acid by using a 3 to 1 ratio of MoS_2 to Sb_2O_3 in the lubricant material and a 79 to 21 ratio of lubricant material to MDA acid (solids) in the admixture. Also, optimum results are obtained with DADPE acid by using a 55 to 45 ratio of MoS_2 to Sb_2O_3 in the lubricant material and a 66 to 34

ratio of lubricant material to DADPE (solids) in the admixture.

Either of the admixtures, after appropriate dilution, is sprayed onto a bearing surface of a bearing component in a layer approximately 0.0005 inch thick. The layer is baked at approximately 200° F. to evaporate the solvent therefrom and then at about 575° F. to cure the film by causing the acid in the film to be converted to its corresponding polyimide by ring closure.

Fiber glass reinforced bearing components are formed utilizing the polyimide composition as a binder for the glass fibers as well as for the lubricant pigment. The fiber glass reinforced components have solid lubricant characteristics as well as structural strength, and may be machined to form bearing sleeves or retainers.

3,567,505

REACTION FILMS ON GLASS SURFACES

Roy V. Harrington, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

No Drawing. Filed Feb. 26, 1968, Ser. No. 707,977

Int. Cl. H05b *33/00*

U.S. Cl. 117—211 **13 Claims**

This invention relates to a method of producing electronically active surface films on a glass substrate by passing a gas containing a reactive anion over the surface of the heated glass substrate which contains a reactive cation and reacting the cation and anion so as to form a film on the surface of the glass substrate, the cations are selected from groups II or III and reacted with anions from groups V or VI respectively, hence either III–V or II–VI compound films can be formed.

3,567,506

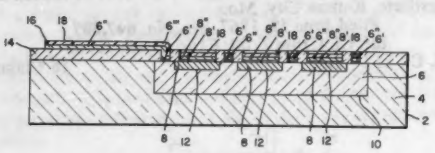
METHOD FOR PROVIDING A PLANAR TRANSISTOR WITH HEAT-DISSIPATING TOP BASE AND EMITTER CONTACTS

Richard J. Belardi, Anaheim, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 22, 1968, Ser. No. 715,349

Int. Cl. H01l *7/00*

U.S. Cl. 117—212 **8 Claims**



A method for providing heat-dissipating top contacts for the base and emitter regions of a planar transistor having a glass coating on the surface thereof in which the heat-dissipating members are formed by plating metal through openings in the glass coating.

3,567,507

ENCAPSULATED ELECTRONIC COMPONENT

Thomas F. Cobb, Ansonia, and William R. Belko, Jr., Huntington, Conn., assignors to Vitramon Incorporated, Monroe, Conn.

No Drawing. Continuation-in-part of application Ser. No. 582,491, Sept. 28, 1966. This application Apr. 30, 1968, Ser. No. 725,540

Int. Cl. H01l *1/10*

U.S. Cl. 117—212 **3 Claims**

A method of hermetically encapsulating electronic components comprising coating less than all of the surfaces with a first refractory material and firing the component to glaze the first refractory material; and, coating the remaining surfaces with a second refractory material having a lower melting temperature than the first refractory material and again firing the component to glaze the second refractory material.

3,567,508

LOW TEMPERATURE-HIGH VACUUM CONTACT FORMATION PROCESS

Theodore R. Cox, Canastota, and Clair E. Logan, North Syracuse, N.Y., assignors to General Electric Company

Filed Oct. 31, 1968, Ser. No. 772,099

Int. Cl. B44d *1/18*

U.S. Cl. 117—212 **8 Claims**

This invention relates to an improved method of forming a metallic electrical contact on a semiconductor body having an insulating cover provided with at least one contact locating aperture exposing a portion of the top surface of the body, and wherein the insulating cover is itself covered or coated with a selectively-patterned mask of heat-removable material such as a layer of organic photoresist. A layer of metal is deposited by condensation from the vapor state, in a vacuum of about 1.0×10^{-6} torr over the surface of the photoresist layer and the surface of the body exposed through the aperture, while maintaining the semiconductor material and photoresist at a temperature slightly below that at which the photoresist begins to char. After the deposition of the metal, removal of the photoresist material together with the portion of the metal layer overlying the photoresist is accomplished by a one-shot heating step, by which the photoresist and the semiconductor material are heated to a temperature in the range of 400 to 570° C. This heating also sinters the un-removed portion of the metal layer to the semiconductor body to provide a non-rectifying electrical connection of increased mechanical strength.

3,567,509

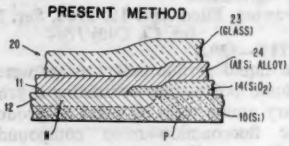
METAL-INSULATOR FILMS FOR SEMICONDUCTOR DEVICES

Lubertus L. Kuiper, Fishkill, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Original application July 22, 1965, Ser. No. 474,074. Divided and this application Feb. 19, 1968, Ser. No. 739,993

Int. Cl. H01l *9/00*

U.S. Cl. 117—217 **2 Claims**



This is a metal-insulating compound film for semiconductor devices wherein the metal is a metal-semiconductor alloy with the semiconductor being a small percentage of the alloy.

3,567,510

METHOD AND APPARATUS FOR SEPARATING COMPONENTS OF SUGARCANE

Sydney E. Tilby, Winterburn, Alberta, Canada, assignor to Canadian Cane Equipment, Ltd., Montreal, Quebec, Canada

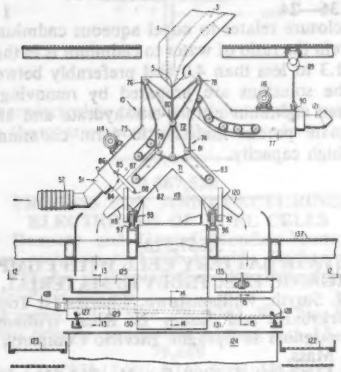
Filed Dec. 20, 1967, Ser. No. 692,185

Int. Cl. C13c *1/00, 1/02;* **C13d** *1/02*

U.S. Cl. 127—2 **19 Claims**

Method and apparatus for separating the pith, rind and epidermis components of split sugarcane stalk. Each

split stalk portion is flattened and milled on the pith side to separate pith from rind and milled on an opposite side to remove epidermis. While the milling away of pith and epidermis is being effected, the rind is maintained in a flattened condition and is positively engaged by rind, velocity-controlling, gripping means which partially penetrate the ring periphery. The rind milling apparatus is characterized by a milling roll having a plurality of generally radially extending milling ridges. Each milling ridge has a planar milling side parallel to



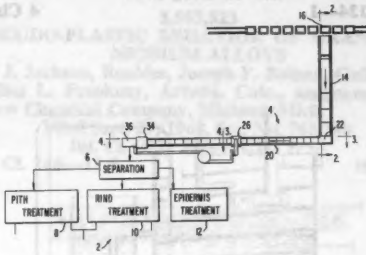
a radial plane of the roll and a peripheral, arcuate, rind-contacting which intersects the planar milling side. The separator apparatus is constructed such that cooperating components of stalk feeding and milling units may be simultaneously separated. The separator apparatus is incorporated with component conveying and handling systems to facilitate the modular stacking of separator units. This modulator stacking increases plant capacity and facilitates a secondary separation of residual pith from rind, after the primary rind and pith separation has taken place.

3,567,511
METHOD AND APPARATUS FOR PROCESSING SUGARCANE

Sydney E. Tilby, Winterburn, Alberta, Canada, assignor to Canadian Cane Equipment, Ltd., Montreal, Quebec, Canada

Continuation-in-part of applications Ser. No. 692,185 and Ser. No. 692,237, both Dec. 20, 1967. This application Mar. 21, 1968, Ser. No. 714,896
Int. Cl. A01f *29/00;* **C13c** *1/00, 1/02*
U.S. Cl. 127—43 **13 Claims**

A process which transforms randomly oriented sugarcane stalks into their pith, rind and epidermis components which are then treated to obtain sugar juice, pith floc, cane fibers and other sugarcane commodities. In delivering the sugarcane stalk material to the separating zone, the stalks are aligned longitudinally in their direction of travel and are chopped transversely thereof into shorted lengths. If the cane contains trash such as leaves and rocks, a fluid is directed through it to remove the trash. At the separating zone the chopped stalks are separated into their pith, rind and epidermis components by opening up longitudinally each chopped stalk into separate portions which are then flattened. As the flattened stalk material is fed through the zone, pith is milled away from one side and epidermis material is milled away from the opposite side. The components are then recovered and can be further treated. The treatment of the pith comprises a washing and pressing operation to extract the juice from the pith. The rind is reduced into smaller portions such as chips or shreds which are then contacted with water



to extract water solubles from the rind. The epidermis can also be treated to separate wax bearing material from certain other epidermis material.

3,567,512
PROCESS FOR THE PURIFICATION OF SUGAR BEET DIFFUSION JUICE

John W. Lyons, St. Louis, and Charles E. Miles, Ballwin, Mo., assignors to Monsanto Company, St. Louis, Mo.

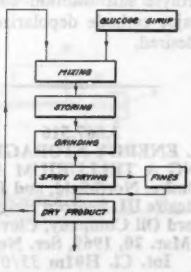
No Drawing. Filed June 17, 1968, Ser. No. 737,346
Int. Cl. C13d *3/02, 3/14*
U.S. Cl. 127—48 **9 Claims**

A process for purifying sugar beet diffusion juice which involves treating said juice with calcium oxide, phosphoric acid and a polyelectrolyte. An anionic, cationic or nonionic polyelectrolyte can be used.

3,567,513
PROCESS FOR THE MANUFACTURE OF A FREE-FLOWING GLUCOSE PRODUCT

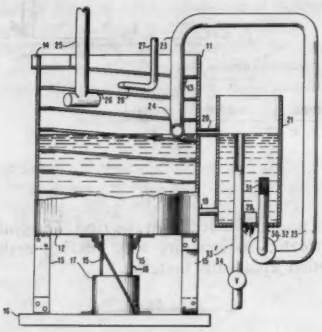
Ove Hansen, Vanlose, Denmark, assignor to Aktieselskabet Niro Atomizer, Soborg, Denmark

Filed Oct. 14, 1968, Ser. No. 767,241
Claims priority, application Denmark, Oct. 17, 1967, 5,137/67
Int. Cl. C13k *1/10*
U.S. Cl. 127—62 **5 Claims**



A process for the manufacture of a glucose product by spray drying. Part of the dried product is mixed with a saturated glucose solution and left standing until a transformation from a gritty to a smooth homogeneous consistency has taken place, then the mixture is recirculated to the spray dryer.

3,567,514
CLEANING AND SEPARATING TABLEWARE
David L. Nystuen, Burnsville, Minn., assignor to Economics Laboratory, Inc., St. Paul, Minn.
Filed Oct. 11, 1968, Ser. No. 766,766
Int. Cl. B08b *3/10*
U.S. Cl. 134—1 **4 Claims**



A vibratory bowl feeder is employed to wash tableware and separate individual pieces for delivery, for example, to a tableware sorter.

3,567,515
ELECTROCHEMICAL CELL CONTAINING SULFUR DIOXIDE AS THE CATHODE DEPOLARIZER
Donald Leonard Maricle, Ridgefield, and John Phillip Mohns, Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.
No Drawing. Continuation of application Ser. No. 735,971, June 11, 1968, which is a continuation-in-part of application Ser. No. 678,476, Oct. 10, 1967, which is a continuation-in-part of application Ser. No. 589,237, Oct. 25, 1966, which in turn is a continuation-in-part of application Ser. No. 454,657, May 10, 1965. This application Mar. 25, 1970, Ser. No. 20,472
Int. Cl. H01m *17/00*
U.S. Cl. 136—6 **16 Claims**

A primary and secondary electrochemical cell effective without electrode separator which comprises in combination an anode of a metal capable of reducing sulfur dioxide, a cathode particularly of a high surface area material, an electrolyte salt solution containing sulfur dioxide as the major cathode depolarizer, with the use of a co-solvent if desired.

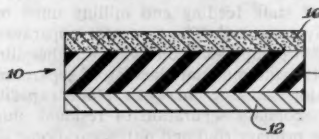
3,567,516
ELECTRICAL ENERGY STORAGE DEVICE CONTAINING A TELLURIUM ADDITIVE
Robert A. Rightmire, Northfield, and James L. Benak and Joseph E. Metcalfe III, Bedford Heights, Ohio, assignors to The Standard Oil Company, Cleveland, Ohio
Filed Mar. 20, 1969, Ser. No. 808,876
Int. Cl. H01m *35/02*
U.S. Cl. 136—6 **5 Claims**

The capacity of an electrical energy storage device containing a high surface area carbon cathode, a metallic anode, and a fused salt electrolyte in contact with the electrodes, can be greatly enhanced by the addition of a tellurium compound directly to the electrolyte or to the carbon cathode. On passage of an electric current through the system, the tellurium becomes permanently bonded to the carbon of the cathode thereby forming an "active" tellurium species that manifests itself as a characteristic plateau in the discharge profile of the cell.

3,567,517
PROCESS FOR PREPARING CADMIUM ELECTRODES
Samuel Korman, Hewlett, N.Y., assignor to Portable Power Corporation, New York, N.Y.
Filed May 29, 1968, Ser. No. 733,061
Int. Cl. H01m *35/30, 43/04*
U.S. Cl. 136—24 **1 Claim**

The disclosure relates to novel aqueous cadmium solutions wherein the ratio of water to cadmium is in the range of about 1.3 to less than 4.0 and preferably between 1.3 to 3.0. The solutions are prepared by removing water from molten cadmium nitrate tetrahydrate and are used to impregnate porous matrices to form cadmium electrodes of high capacity.

3,567,518
SOLID-STATE BATTERY CELL WITH COMPLEX ORGANIC ELECTROLYTE MATERIAL
Donald M. Smyth, Williamstown, Charles H. Tompkins, Jr., Clarksburg, and Sidney D. Ross, Williamstown, Mass., assignors to Sprague Electric Company, North Adams, Mass.
Filed Oct. 7, 1968, Ser. No. 765,531
Int. Cl. H01m *11/00;* **B01k** *3/12*
U.S. Cl. 136—83 **3 Claims**

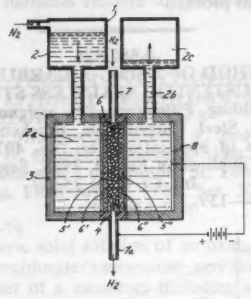


In a battery or an electrical capacitor the solid electrolyte is a new composition of matter defined as the quaternary ammonium iodide-silver iodide reaction product of a Z-quaternary ammonium iodide and silver iodide, wherein the molar ratio of silver ion to the quaternary ammonium ion is greater than 2:1. The Z-quaternary ammonium ion is a member of the group consisting of R_4N^+, N—R substituted pyridinium, N—R substituted quinolinium and N—R substituted isoquinolinium. R is an alkyl, aryl, alkaryl or aralkyl group, and the R groups of R_4N^+ are the same or any combination of said groups.

3,567,519
DEPOLARIZATION PROCESS
Ralf Wendtland and August Winsel, Braunschweig, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munchen, and Varta Aktiengesellschaft, Frankfurt am Main, Germany
Continuation-in-part of applications Ser. No. 269,907, Apr. 2, 1963, now Patent No. 3,428,491, and Ser. No. 545,986, Apr. 28, 1966. This application Oct. 4, 1968, Ser. No. 765,134
Claims priority, application Germany, Apr. 30, 1965, P 15 46 719.3
Int. Cl. H01m *27/00*
U.S. Cl. 136—86 **12 Claims**

A method of controlling the concentration polarization during the operation of a fuel cell. Electrolyte is

passed through the small pores of an electrode from one face thereof in one electrolyte chamber to the other face



in another electrolyte chamber while reaction gas is passed through the coarser pores of the electrode.

3,567,520
PROCESS FOR MANUFACTURING ELECTRODES OF FUEL CELLS

Francis Dennery and Gerard Mondain-Monval, Paris, France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et Exploitation des Procedes Georges Claude, Paris, France

No Drawing. Filed Sept. 28, 1967, Ser. No. 671,188
Claims priority, application France, Oct. 13, 1966, 79,869
Int. Cl. C23f 17/00; F26b 5/06; H01m 13/04
U.S. Cl. 136—120 **7 Claims**

Process for manufacturing electrodes for fuel cells, wherein a paste, comprising a mechanically resistant material in the dry state, a solvent for this material and possibly an oxidation or reduction catalyst or a component capable of generating such a catalyst, is subjected to a freeze-drying in which at least one of the operations of freezing and sublimation is effected at a sufficiently variable speed, for there to be formed a material having pores of variable size over its thickness, and variable concentrations of the catalyst or of the component capable of generating it.

3,567,521
POLYMER COATING OF METAL SURFACES

Madeline S. Toy, Fountain Valley, and Nathan A. Tiner, Laguna Beach, Calif., assignors to McDonnell Douglas Corporation, Santa Monica, Calif.

No Drawing. Filed Aug. 5, 1968, Ser. No. 749,999
Int. Cl. C23f 7/00
U.S. Cl. 148—6.3 **17 Claims**

Polymer coated metal surface and process therefor. The metal surface is first treated with elemental fluorine to form an integral, chemically bonded surface coating of metal fluoride. The metal fluoride surface coating is then exposed to a film forming monomer, e.g., tetrafluoroethylene, to cause in situ polymerization thereon and produce a uniform, continuous, adherent polymer coating. Such tetrafluoroethylene polymer coated metal surfaces provide excellent corrosion resistance useful for protective coatings particularly on metal structural components.

3,567,522
METHOD OF PRODUCING ZIRCONIUM BASE ALLOYS

Kenneth C. Thomas and Robert J. Allio, Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

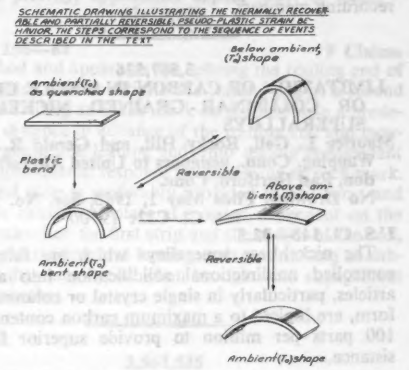
No Drawing. Filed Dec. 15, 1965, Ser. No. 514,129
Int. Cl. C22f 1/18
U.S. Cl. 148—11.5 **3 Claims**

A process for producing a zirconium base alloy member having improved tensile strength and ductility properties prior to nuclear radiation by first cold working the member to induce a 7% to 20% strain. The member is then heat treated at temperatures lower than the usual annealing temperatures.

3,567,523
PSEUDO-PLASTIC BEHAVIOR OF URANIUM-NIOBIUM ALLOYS

Ross J. Jackson, Boulder, Joseph F. Boland, Golden, and Julius L. Frankeny, Arvada, Colo., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sept. 27, 1968, Ser. No. 763,180
Int. Cl. C22c 27/00; C22f 1/18
U.S. Cl. 148—11.5 **10 Claims**

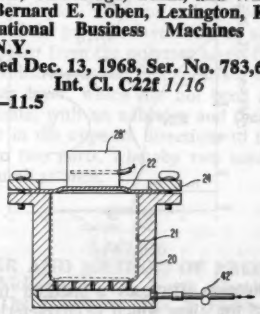

SCHEMATIC DRAWING ILLUSTRATING THE THERMALLY RECOVERABLE AND PARTIALLY REVERSIBLE, PSEUDO-PLASTIC STRAIN BEHAVIOR. THE STEPS CORRESPOND TO THE SEQUENCE OF EVENTS DESCRIBED IN THE TEXT.
Below ambient, (T_2) shape
Ambient (T_0) as quenched shape
Plastic bend
Reversible
Above ambient (T_1) shape
Ambient (T_0) bent shape
Reversible
Ambient (T_0) shape

The present invention provides a process for achieving an unusual, thermally recoverable and reversible, pseudo-plastic strain behavior in uranium-niobium alloys, as well as useful products prepared therefrom. The process comprises rapidly cooling a uranium-niobium alloy from the gamma region, plastically deforming the same at a temperature below 450° C., and subsequently heating or cooling the alloy to cause it to exhibit pseudo-plastic behavior.

3,567,524
METHOD OF PRODUCING MOLDINGS AND THE PRODUCTS OF THIS METHOD

Jackie L. Cook, Oak Ridge, Tenn., and William G. Ralston and Bernard E. Toben, Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 13, 1968, Ser. No. 783,640
Int. Cl. C22f 1/16
U.S. Cl. 148—11.5 **23 Claims**



Wall thinning of moldings made by pressure deformation is avoided by locally preconditioning the material structure of a sheet of suitable material, for example, a superplastic metal. The preconditioning includes a heat treatment of the material structure in selected portions of the sheet to reduce the strain plasticity in these portions during the forming process.

3,567,525

HEAT TREATED FERROMAGNETIC PARTICLES

Arthur Hughes Graham, Ernest Lewis Little, Jr., and Jack D. Wolf, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed June 25, 1968, Ser. No. 739,732
Int. Cl. C21d *1/04;* H01f *1/06, 7/02*
U.S. Cl. 148—31.57 10 Claims

Ferromagnetic alloy particles of iron, nickel or cobalt, and optionally chromium supersaturated with boron, nitrogen or phosphorus which are prepared by reduction of a solution containing salts of the appropriate metals, are converted to polyphase particles of substantially unchanged size having improved magnetic properties by heating below their sintering temperatures. The ferromagnetic particles are useful for making magnets and for making magnetic recording members.

3,567,526

LIMITATION OF CARBON IN SINGLE CRYSTAL OR COLUMNAR-GRAINED NICKEL BASE SUPERALLOYS

Maurice L. Gell, Rocky Hill, and Gerald R. Leverant, Wapping, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

No Drawing. Filed May 1, 1968, Ser. No. 725,889
Int. Cl. C22c *19/00*
U.S. Cl. 148—32.5 3 Claims

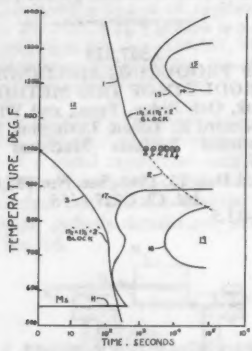
The nickel-base superalloys which are fabricated by controlled unidirectional solidification into anisotropic articles, particularly in single crystal or columnar-grained form, are limited to a maximum carbon content of about 100 parts per million to provide superior fatigue resistance.

3,567,527

METALLURGICAL PROCESS AND PRODUCT

Maxwell Pevar, Philadelphia, Pa.
(551 Shoemaker Road, Elkins Park, Pa. 19117)

Continuation of application Ser. No. 497,926, Oct. 19, 1965. This application Dec. 16, 1968, Ser. No. 794,835
Int. Cl. C21d *1/00*
U.S. Cl. 148—127 14 Claims



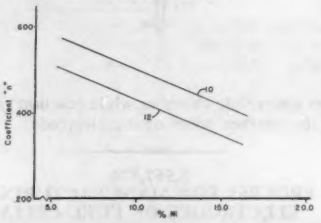
This application discloses a method for heat treating metals of the class which is characterized by having a time-temperature-transformation, or T-T-T diagram wherein there is a high temperature long-time transformation region spaced above a low temperature short-time transformation region, the treatment being conducted in a manner to avail of the intermediate region between the high temperature transformation region and the low temperature transformation region and minimize quenching stresses, distortion, residual stresses, and cracking; also welding, when desired, in the intermedate region to produce homogeneous welded objects without special after-weld treatments; also the improved product of the heat-treatment process.

3,567,528

METHOD OF USING A CARBURIZED AUSTENITIC STAINLESS STEEL

Gunther Mohling, Pittsburgh, Pa., assignor to Allegheny Ludlum Steel Corporation, Brackenridge, Pa.

Continuation of application Ser. No. 407,298, Oct. 29, 1964. This application Feb. 9, 1968, Ser. No. 704,944
Int. Cl. C22c *35/00*
U.S. Cl. 148—139 5 Claims



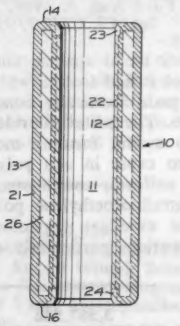
An austenitic steel is described which is suitable for use as valves and valve components for use in an internal combustion engine after the article has been carburized. The steel possesses a composition which includes up to 0.10% carbon, up to 0.20% silicon, up to 0.70% manganese, 0.06% maximum nitrogen, 13% to 22% chromium, 9% to 20% nickel and up to 33% copper, the sum of the nickel plus copper being within the range between 10% and 21% with the balance essentially iron. The steel is characterized by a low rate of work hardening and excellent ductility. Data was presented to demonstrate the cold workability by means of the slope of the true stress-true strain curve and the cold work hardening factor. Equations are presented for balancing the alloying components to obtain the desired cold work hardening rate.

3,567,529

DIFFERENTIALLY TREATED TRACK BUSHING

Robert D. Burtnett, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 3, 1969, Ser. No. 803,638
Int. Cl. C21d *1/00*
U.S. Cl. 148—148 17 Claims



A cylindrical bushing having a longitudinal bore therethrough, the outer diameter of the bushing being hardened to resist wear with the inner diameter of the bushing being differentially tempered with a reduced hardness relative to the outer diameter in order to resist shock and the development of cracks.

A method of manufacturing the above bushing comprising the steps of forming the bushing, hardening at

least the outer diameter of the bushing, and then differentially tempering the inner diameter to a substantially reduced hardness relative to the outer diameter.

3,567,530

POLYMERIC PROPELLANT COMPOSITION CONTAINING LITHIUM PERCHLORATE/AMMONIUM PERCHLORATE EUTECTICS

Robert I. Lait, Swampscott, Stanley F. Bedell, Andover, and Lucius G. Gilman, Wakefield, Mass., assignors to Monsanto Research Corporation, St. Louis, Mo.

No Drawing. Filed July 2, 1962, Ser. No. 207,468
Int. Cl. C06d *5/00*
U.S. Cl. 149—76 19 Claims

1. A polymeric solid solution of an oxidant amount of the lithium perchlorate/ammonium perchlorate eutectic and the polymer of a monomer including a hetero atom selected from the group consisting of O, S and N, in the same homogeneous phase.

3,567,531

HIGH ENERGY THIXOTROPIC FUEL COMPOSITIONS

Glenn Fuller and Alfred John Lawrence Toombs, Berkeley, Calif., assignors to Shell Oil Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 302,444, Aug. 15, 1963. This application Mar. 17, 1964, Ser. No. 352,682
Int. Cl. C10l *7/00*
U.S. Cl. 149—87 16 Claims

1. A thixotropic composition consisting essentially of a mixture of finely divided particles selected from the group consisting of metal particles and metal hydride particles in a liquid hydrocarbon, gelled by admixture therewith of (a) 98–90% by weight of a monoester of a hydrocarbylthiomethyl phosphonic acid and a C_{1-18} alkanol and (b) 2–10% by weight of a di- to tri-basic pentavalent phosphorus acid having from 0 to 1 monohaloalkyl substituents, wherein the alkyl group contains from 1 to 4 carbon atoms.

3,567,532

ACIDIC CONDITIONER FOR PLASTIC MATERIALS

James L. Jezl, Swarthmore, and Habet M. Khelghtian, Springfield, Pa., assignors to Avisun Corporation, Philadelphia, Pa.

No Drawing. Filed Jan. 3, 1969, Ser. No. 788,954
Int. Cl. B44c *1/22;* C23d *1/00*
U.S. Cl. 156—2 9 Claims

In an acidic conditioning bath containing (a) a strong, liquid mineral acid, (b) a hexavalent chromium compound and (c) water, from about 0.01% to about 5% by weight of an aryl sulfonic acid or an aryl phosphonic acid is added to the aforementioned conditioning bath components. The acidic conditioner is useful for chemically etching the surface of a plastic article prior to treating the article with a metallizing process. Adhesion of the deposited metal to the surface of the plastic article is improved when the plastic article is immersed in the acidic conditioning bath.

3,567,533

TIN SOLDER COATED WITH CHROMIUM AS A MASK FOR ETCHING A METAL BASE

John S. C. Chiang, Cranbury, N.J., and Joseph T. McManamon, Levittown, Pa., assignors to FMC Corporation, New York, N.Y.

No Drawing. Filed Feb. 20, 1969, Ser. No. 801,199
Int. Cl. C23f *1/00, 17/00*
U.S. Cl. 156—11 5 Claims

A method of etching a metal workpiece is described, which carries a tin resist (or a tin-coated solder resist); a chromate coating is provided over the resist, and the metal workpiece is etched with an aqueous etchant such as a peroxysulfate containing phosphoric acid or a sodium chlorite-ammonium hydroxide solution or a chromic-sulfuric acid bath to dissolve the metal free of resist, thus producing bright, smooth and electrically clean reliefs having sharp pattern definition on the metal workpiece.

3,567,534

AUTOMATIC WEB SPLICING SYSTEM AND METHOD

Eishiro Kushiro, Tokyo, Japan, assignor to Nihon Regulator Co., Ltd., Tokyo, Japan

Filed Oct. 23, 1968, Ser. No. 769,946
Claims priority, application Japan, Nov. 6, 1967, 42/70,957
Int. Cl. G01p *3/00*
U.S. Cl. 156—64 9 Claims

A method and apparatus for splicing the trailing end of a first moving web or strip to the leading end of a second strip by providing an index mark on the first strip a predetermined distance in advance of the trailing end and moving the trailing and leading ends into sealing engagement at the proper time in response to the sensing of such mark. The second strip is preferably provided in coil form and the coil is caused to rotate at a speed dependent on the speed of travel of the first strip and the radius of the coil, whereby the trailing and leading ends are moving at substantially the same speed when brought into engagement with one another.

3,567,535

PROCESS FOR MANUFACTURE OF SUEDE-LIKE SHEET MATERIAL

Kazuo Noda, Takao Matsuura, and Hidehiko Shimamura, Kurashiki, Japan, assignors to Kurashiki Rayon Co., Ltd., Kurashiki, Japan

No Drawing. Filed Dec. 16, 1968, Ser. No. 784,233
Claims priority, application Japan, Dec. 29, 1967, 43/85,178; Feb. 1, 1968, 43/6,162; Feb. 9, 1968, 43/8,104
Int. Cl. B32b *5/18, 31/08, 31/18*
U.S. Cl. 156—77 2 Claims

A process for manufacture of suede-like sheet materials comprising applying a solution of a polymer such as polyurethane to a support, such as glass or polymer sheet to form a polymer solution layer, dipping the polymer solution layer applied on the support to coagulate the polymer solution into a layer having a relatively large spongy structure in inner part, adhering a first fibrous substrate to the surface of the polymer layer with an adhesive, peeling off the support from the polymer layer, further adhering a second substrate as the first substrate to the surface of the polymer layer, which has not been adhered with the first substrate, with an adhesive and then pulling the polymer layer in the opposite directions to tear the polymer layer into two parts, whereby two suede-like sheets are manufactured at once.

3,567,536

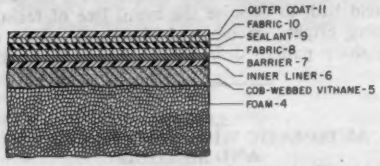
CONTAINER AND METHOD OF PREPARATION

William S. Wickersham, Jr., North Canton, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 7, 1968, Ser. No. 703,677
Int. Cl. B32b *5/18*
U.S. Cl. 156—78 4 Claims

This invention relates to a container and the method of making said container comprising forming a foraminous mass or a reticulated foam having the shape of the desired container, sealing the surface opening of the foraminous mass and applying a coating of the container material over the sealed layer on the foraminous mass

to form the sides of the container. Preferably, the foraminous mass is a reticulated polyurethane foam and

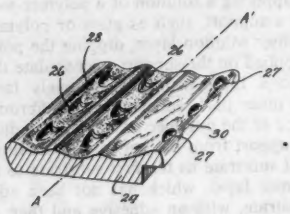


the sealing material is a polyurethane reaction mixture which when sprayed forms a cobwebbing and the coating material is an elastomeric material.

3,567,537
POWDERED THERMOPLASTIC BAG SEALING PROCESS
William W. Martney, Toledo, and Charles P. Spring, Sylvania, Ohio, assignors to Owens-Illinois, Inc.
Filed July 31, 1967, Ser. No. 657,378
Int. Cl. B32b *7/08*
U.S. Cl. 156—91 **4 Claims**

This invention is concerned with a bag sealing method wherein a thermoplastic powder is utilized to hermetically seal the sewn end of a bag including the gussets. The seal is effected by the application of heat and pressure to the thermoplastic powder coated areas. The application of heat and pressure causes some of the thermoplastic material to migrate into and through the sewn portion so as to produce a durable hermetic seal.

3,567,538
PROCESS OF MAKING LAMINATED METAL FOIL PRODUCT
Douglas T. Lind, Barrington, Ill., assignor to Arvey Corporation
Filed Dec. 14, 1967, Ser. No. 690,439
Int. Cl. B29d *31/00;* **B32b** *15/08*
U.S. Cl. 156—154 **5 Claims**



A laminated sheet suitable for "antiquing" is prepared comprising a metallic foil layer with a transparent plastic film adhering to one side thereof. The plastic film carries on its exposed surface an opaque coating comprising a pigment dispersed in a binder which adheres to the plastic film. The physical strength of the opaque coating is substantially less than that of the plastic film, so that portions of the coating can be removed by buffing action without removing the plastic film from the foil and without damaging the foil underneath. Typically, the foil is aluminum, and at least the outer portion of the plastic film is a biaxially-oriented polyester resin. The laminated sheet of this invention can be affixed to an irregular surface of a substrate and pressed so as to conform to the irregularities, or it can be applied to a flat substrate and embossed to form an irregular surface. The sheet of this invention can be used to impart a metallic sheen to selected portions of a substrate after buffing, and also to impart an "antiqued" appearance resulting from the fact that the opaque coating can be removed by buffing from the high spots of the irregular surface without removing the coating from the recesses and corners.

3,567,539
METHOD OF MAKING A TUBULAR THERMOPLASTIC LAMINATE
Henry G. Schirmer, Spartanburg, S.C., assignor to W. R. Grace & Co., Duncan, S.C.
Filed Aug. 11, 1967, Ser. No. 660,043
Int. Cl. B29c *17/00*
U.S. Cl. 156—156 **5 Claims**

A laminated thermoplastic film is produced by passing slightly inflated, irradiated polyethylene tubing through a circular die, coating a molten ethylene vinyl acetate copolymer onto the tubing whereby the polyethylene is heated to its orientation temperature while the copolymer is cooled to a temperature suitable for hot blowing, and immediately expanding the laminate as it leaves the die by internal air pressure.

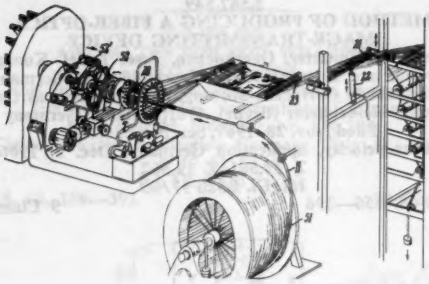
3,567,540
SPLICING OF POLYESTER FILMS
Heinrich Tacheci, Bad Homburg, Manfred Sander, Kelkheim, and Pedro Pintaske, Waldacker, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany
Filed Nov. 15, 1967, Ser. No. 683,251
Claims priority, application Germany, Nov. 28, 1966, A 54,196
Int. Cl. B65h *69/02*
U.S. Cl. 156—157 **8 Claims**

Polyester films such as moving picture film of polyethylene terephthalate, are spliced by swelling the faces to be joined with a coumarin, a partially etherified polyhydric phenol, or a partially etherified polyhydric naphthol, and then pressing these faces together for not more than a few seconds at 100 to 180° C. Such splicing does not cause shrinkage and the swelling agents are innocuous.

3,567,541
METHOD OF WINDING LAMINATED SECTIONS FOR USE AS ELECTROMECHANICAL STRUCTURAL ELEMENTS WHICH CONTAIN A CENTRAL CORE OF CELLULAR PLASTIC FOAM
Alexandre Kaczerginski, Vichy, Allier, France, assignor to Societe Europeenne d'Isolateurs en Verre Sediver, Paris, France
Filed Oct. 7, 1968, Ser. No. 765,524
Claims priority, application France, Oct. 13, 1967, 124,412
Int. Cl. B65h *81/00*
U.S. Cl. 156—172 **13 Claims**

The continuous production of laminated sections of general cylindrical formation having excellent mechanical and electrical properties to render them especially adapted for use as insulators in electrical transmission networks, and comprising a central core of cellular plastic foam sheathed by one or more layers of resin reenforced with resin-impregnated glass filaments extending longitudinally and circumferentially as well as by an outer relatively thick covering layer of resin, with or without fillers, which is molded before hardening with a smooth cylindrical, fluted or finned outer surface. The invention

contemplates the inclusion of anchoring sockets at predetermined spacings along the central core, which, upon



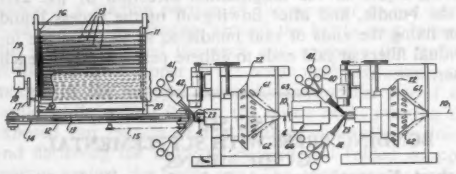
severance into individual units, serve for the sealing therein of supporting devices for the units.

3,567,542

METHOD OF MANUFACTURING FIBER GLASS REINFORCED PLASTIC TUBING USING SEQUENTIALLY INSERTED MOVING MANDRELS

Carl Thomas Jackson, North Madison, Ohio, assignor to True Temper Corporation, Cleveland, Ohio

Filed July 25, 1967, Ser. No. 655,919
Int. Cl. B65h *81/00*
U.S. Cl. 156—172 13 Claims



There is disclosed herein a method and apparatus for continuously producing fiber glass reinforced articles by continuously pulling a plurality of fiber glass strands along a production line, some of said strands being provided with an uncured resin, arranging the strands into a tubular shape, successively inserting mandrels into the tube thus formed, curing the resin, cutting the mandrels apart, and removing the mandrels from the hollow articles formed thereon.

3,567,543

METHOD OF MANUFACTURING A FIBRE REINFORCED RESIN STRUCTURE

Arthur E. Standage, Nottingham, and William Neil Turner, Derby, England, assignors to Rolls-Royce Limited, Derby, England

No Drawing. Filed July 7, 1967, Ser. No. 651,663
Claims priority, application Great Britain, July 23, 1966, 33,241/66
Int. Cl. B29d *7/14*; B32h *54/00*
U.S. Cl. 156—174 9 Claims

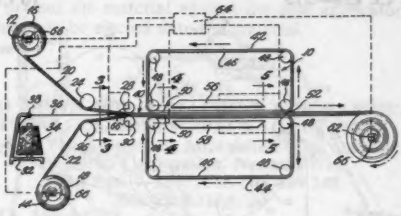
A method of producing a fibre reinforced resin structure using a resin which is intractable in its cured form but which has a tractable intermediate formed during its synthesis. The method consists of coating layers of the fibres with the tractable intermediate in the form of a resin solution, partly curing the individual layers, applying a further coating of the resin to each layer, pressing the layers together and finally completely curing the composite structure.

3,567,544

METHOD OF HOT MELT SEAMING OF FABRIC MATERIALS USING A HIGH FREQUENCY ELECTRIC FIELD

Iven G. Nichols, Pompton Plains, N.J., assignor to Standard Brands Chemical Industries, Inc., Dover, Del.

Filed Dec. 22, 1967, Ser. No. 693,013
Int. Cl. B32b *5/08*
U.S. Cl. 156—176 12 Claims



The continuous, rapid forming of a hot melt bonded seam in articles of fabric material by first constructing a multi-ply assemblage of fabric material with a thermoplastic filament between the plies and passing the multi-ply assemblage through a high frequency electrical field that will instantly melt selectively the filament while the multi-ply assemblage is compressed so as to cause the melted filament to penetrate evenly the fabric plies; and the seam bonded articles produced by this process.

An apparatus that continuously and rapidly produces hot melt seam bonding of plies of fabric material having means for forming a continuous multi-ply assemblage of fabric material, the positioning of a thermoplastic filament along a line of desired seam bonding in the assemblage, and means for passing the multi-ply assemblage through a high frequency electrical field that is attuned to melt selectively the filament while pressure is applied to compress the multi-ply assemblage.

3,567,545

METHOD OF FORMING FIBERTAPES USING ROTATING MATING PRESSURE ROLLS

Emilian Bobkowicz and Andrew J. Bobkowicz, both of 1435 St. Alexander St., Room 310, Montreal, Quebec, Canada

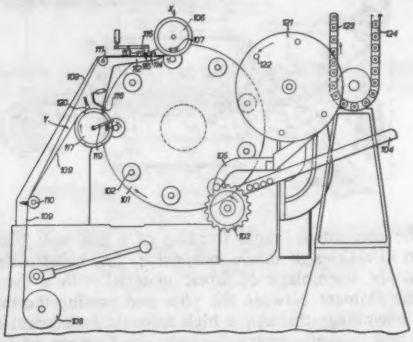
Filed May 14, 1968, Ser. No. 729,090
Claims priority, application Canada, Sept. 26, 1967, 1,047
Int. Cl. B29c *15/00*
U.S. Cl. 156—229 21 Claims

Apparatus for continuous production of fibertapes, with elimination of subsequent separate slitting operations comprising a pair of rotatable pressure rolls with continuous circumferential grooves on their surface, the rolls being so positioned side by side that each male member of the grooved surface of one roll fits into the corresponding female member of the other roll; and a method for producing fibertapes by introducing staple fibers and a polymeric bonding agent between such rotating grooved pressure rolls.

3,567,546
METHOD OF PRODUCING HOLLOW COLLAPSIBLE CONTAINERS

Cecil Edward Morris, Bolton, Ralph William Birch, Woking, and Edmund Philip Adcock and Neil Malcolm McDonnell, Harpenden, England, assignors to United Glass Limited, Staines, England

Filed Sept. 20, 1967, Ser. No. 669,063
Claims priority, application Great Britain, Apr. 20, 1967, 18,338/67
Int. Cl. B29c *19/06*
U.S. Cl. 156—275 10 Claims



A hollow container is produced by forming a hollow body of thermoplastic material, wrapping a layer of metal foil around the outer surface of the hollow body, and causing the layer of metal foil to adhere to the surface of the hollow body.

3,567,547
METHOD OF PROVIDING THIN GLASS PARTS OF PRECISE DIMENSIONS

John R. Mattson, 162 S. Wabasha 55107, and Roy D. Mattson, 415 Minnesota Ave. 55113, both of St. Paul, Minn.

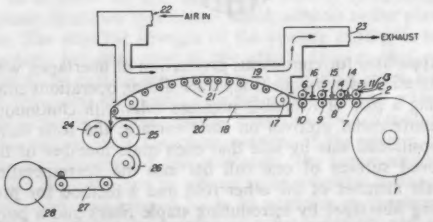
No Drawing. Filed June 22, 1967, Ser. No. 647,901
Int. Cl. B32b *31/00*
U.S. Cl. 156—247 5 Claims

A method of machining thin glass parts with precise dimensions including applying an abrasive resistant coating to the parts and forming the parts into a solid block by providing an adhesive therebetween. The parts can then be precisely machined, after which the parts are separated by removing the adhesive with a first solvent, which first solvent does not affect the abrasive resistant coating. Immediately prior to use the abrasive resistant coating can be removed through the use of a second solvent.

3,567,548
PRODUCTION OF PERMANENTLY SCULPTURED PILE FABRICS

Philip Miller, 4 Redwood Road, Norwalk, Conn. 06850

Filed May 12, 1967, Ser. No. 639,927
Int. Cl. D03c *19/00*
U.S. Cl. 156—277 12 Claims

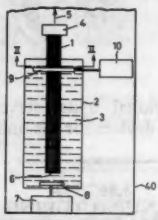


Deep sculpturing pile fibers, e.g., acrylic and polyester, by depositing polar solvent containing solutions for the fiber in the pile, e.g., dimethyl formamide, dimethyl sulfoxide, having a viscosity of 500 to 1000 cps.

3,567,549
METHOD OF PRODUCING A FIBER-OPTICS IMAGE-TRANSMITTING DEVICE

Dietrich Hoffmeister, Oberkochen, Josef Ladel, Konigsbronn, and Fritz Schleich, Wasseralfingen, Germany, assignors to Carl Zeiss-Stiftung, doing business as Carl Zeiss, Heidenheim (Brenz), Wurttemberg, Germany

Filed Nov. 28, 1967, Ser. No. 686,264
Claims priority, application Germany, Dec. 1, 1966, Z 12,561, Z 12,562
Int. Cl. B32b *17/00*
U.S. Cl. 156—296 9 Claims

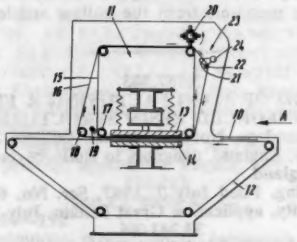


A fiber-optics image-transmitting device is produced by holding a bundle of substantially straight fibers—each fiber consisting of a core of light-conducting material covered by jacket of transparent material having a lower index of refraction than said core material—at one end and immersing the bundle with the other end entering first into a wetting liquid withdrawing said bundle from the wetting liquid in the longitudinal direction of the axis of the bundle, and after flowing-off of the excess liquid then fixing the ends of said bundle so as to cause the individual fibers at said ends to adhere permanently to each other.

3,567,550
BONDING PRESS WITH SUPPLEMENTAL GUIDE MEANS

Herbert Kannegiesser and Richard Juraschek, Vlotho (Weser), Germany, assignors to Kannegiesser Maschinenfabrik Gesellschaft mit beschrankter Haftung, Vlotho (Weser), Germany

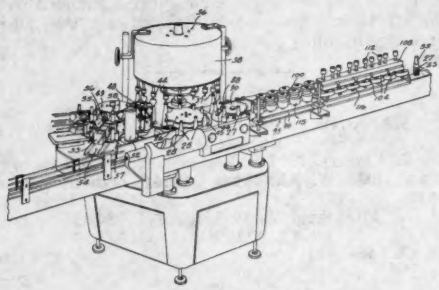
Filed Feb. 25, 1969, Ser. No. 802,080
Claims priority, application Germany, Mar. 11, 1968, K 60,577
Int. Cl. B32b
U.S. Cl. 156—389 10 Claims



This invention provides a bonding press composed of an upper heated press plate and a preferably stationary bottom press plate, through which superimposed pieces of fabric to be stuck together are fed on an endless conveyor belt. The upper heated press plate is covered on its underside by an endless covering band which in turn is covered on its underside facing the pieces of fabric by endless guide means preferably consisting of a plurality of parallel thin narrow tapes spaced apart. The conveyor belt, the covering ban and the guide means are intermittently

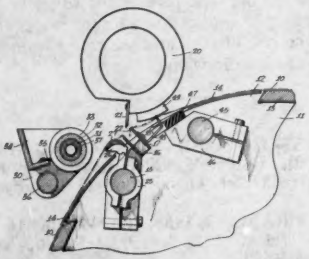
synchronously driven, the guide means traveling on the exit side of the press beyond the point of deflection of said covering band in a direction that differs from that of said covering band after it has been deflected.

3,567,551
APPARATUS FOR FOIL WRAPPING BOTTLE NECKS
Karl Dullinger, Neutraubling, Germany, assignor to Hermann Kronseder, Neutraubling, Germany
Filed June 25, 1969, Ser. No. 836,285
Claims priority, application Germany, July 12, 1968, P 17 61 837.0
Int. Cl. B32b *35/00*
U.S. Cl. 156—391 **22 Claims**



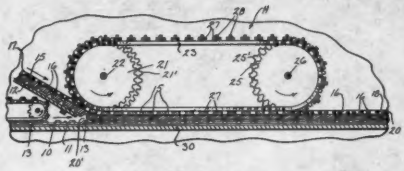
Method and apparatus for foil wrapping bottle necks and the like with precut foil wrappers stored in a magazine and comprising advancing unwrapped bottles along a path, successively feeding individual foil wrappers from the magazine toward a bottle station along said path, applying a leading portion of the wrapper to the bottle neck, rolling the wrapper around the bottle neck to wrap the wrapper around the neck and applying the trailing portion of the wrapper to the bottle neck, exposing a top margin of the wrapper upwardly beyond the top of the bottle while rolling it onto the bottle neck, pressing the exposed top margin of the wrapper inwardly in folds, and flattening the inwardly pressed and folded wrapper margin against the bottle top. The conveyor consists of individual bottle turntables and clamping stems for holding the bottle in vertical orientation while it is rotated against flaps, pads, and brushes, etc., to smooth the wrapper onto the bottle. An infeed star wheel has spaced plates with peripheral pockets which are aligned vertically and which hold the bottle in vertical orientation.

3,567,552
ROLL END FASTENING
Michael Heuff and Pierre A. Bornais, Trois Rivieres, Quebec, Canada, assignors to Consolidated Paper (Bahamas) Limited, Nassau, N.P., Bahamas
Filed Dec. 20, 1967, Ser. No. 691,995
Int. Cl. B65h *19/06*
U.S. Cl. 156—468 **5 Claims**



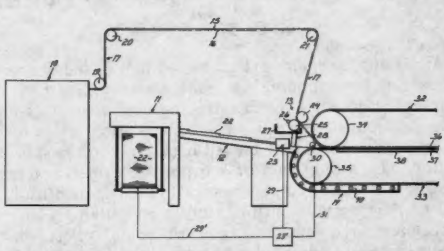
Apparatus for providing for the fastening of the end of a roll of material, such as toilet and similar paper rolls, in which the conventional bed-roll, in addition to a pivotally mounted knife blade which is mounted within the roll and reciprocates out of the roll to cut the material, in cooperation with a further blade on a roller mounted parallel to and adjacent the bed-roll, also has a glue applicator by means of which a localized spot of glue is applied to the material a short distance from the end. More than one spot of adhesive may be applied, spaced across the material. The glue may be applied by a member which reciprocates with the knife blade and momentarily presses the material against the glue applicator, or the glue may be ejected onto the material.

3,567,553
HOLD DOWN FOR A MACHINE FOR FABRICATING A CUSHIONING PACKAGING STRIP
Lloyd D. Van Antwerpen, Milwaukee, Wis., assignor to Menasha Corporation, Neenah, Wis.
Filed Apr. 7, 1967, Ser. No. 629,242
Int. Cl. B31f *1/00*
U.S. Cl. 156—471 **4 Claims**



An improved hold down mechanism for a machine for feeding, forming and adhesively joining a series of independent sheets to provide a cushioning packaging strip. The machine having conveyor driven forming blocks overlying the joined sheets and a bed plate over which the sheets travel toward the discharged end of the machine. The hold down mechanism firmly presses and holds the said sheets together during the setting of the adhesive, and includes a series of pressure slats, secured between chains, and overlying a respective forming-block so that pressure is entered through the said pressure slats on the forming blocks.

3,567,554
METHOD AND APPARATUS FOR COMBINING PRINTED SHEETS WITH SINGLE FACE CORRUGATED PAPER
Charles H. Klein, James K. Haley, and Alfred C. Sides, Cincinnati, Ohio, assignors to Novelart Manufacturing Company, Cincinnati, Ohio
Continuation-in-part of applications Ser. No. 286,600, May 20, 1963, and Ser. No. 548,599, May 9, 1966. This application Feb. 10, 1967, Ser. No. 615,215
The portion of the term of the patent subsequent to Feb. 28, 1984, has been disclaimed
Int. Cl. B31f *1/00*
U.S. Cl. 156—470 **3 Claims**



Apparatus in which a single face corrugated web is fed, with its flutes facing downwardly, through a glue

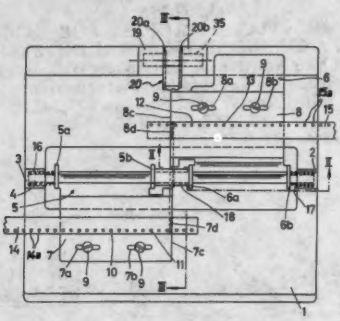
applicator at a combining station and in which preprinted discrete sheets are fed serially to the combining station underneath the corrugated web.

3,567,555

APPARATUS FOR SPLICING FILMS OR THE LIKE

Volkmar Stenzenberger and Hermann Müller, Munich, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 5, 1968, Ser. No. 781,312
Claims priority, application Germany, Dec. 16, 1967, P 15 97 661.1
Int. Cl. G03d *15/04*
U.S. Cl. 156—502 **17 Claims**



A portable film splicing apparatus wherein two film supporting platforms can turn on a shaft and are biased axially toward each other to normally bear against the opposite ends of a distancing sleeve on the shaft. One of the platforms is pivotable on the shaft between a first position in which the film portions on the two platforms are parallel to and coplanar with each other and a second position in which the film portions overlie and bear against each other. Two knives can be pivoted into engagement with counterknives on the platforms in the first position of the one platform to trim the corresponding film portions and to simultaneously move the platforms away from the distancing sleeve. Such knives are adjacent to two scraping members which can be reciprocated by hand to roughen the film portions adjacent to their trimmed ends. The thus roughened film portions are coated with adhesive after the knives are moved away from the platforms so that the one platform can be pivoted to second position in which the adhesive-coated film portions are cemented to each other to form a lap splice.

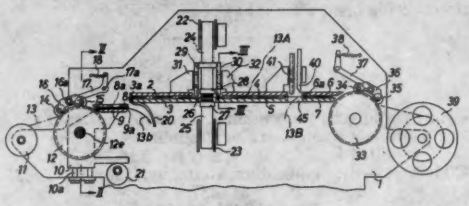
3,567,556

APPARATUS OR TRIMMING AND SPLICING STRIPS OF ROLL FILM OR THE LIKE

Michael Fensterl, Munich, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 25, 1967, Ser. No. 670,287
Claims priority, application Germany, Sept. 30, 1966, A 26,446
Int. Cl. B31f *5/00*
U.S. Cl. 156—505 **11 Claims**

Apparatus for splicing strips of roll film or the like end-to-end and for trimming the leading and trailing ends of strips prior to splicing. The trailing end of a preceding strip is trimmed between the splicing station and a take-up reel and is thereupon moved backwards to the splicing station. The leading end of a following strip is trimmed prior to transport into abutment with the trimmed trailing end of the preceding strip. In order to flatten the strips, the apparatus comprises a pair of guide rollers which are respectively disposed upstream and downstream of the splicing station and each of which cooperates with pressing rolls which bias the strips against the peripheral surfaces of the respective guide rollers and prevent longitudinal buckling or curling of strips. The leading end of a following strip is trimmed in response to upward move-



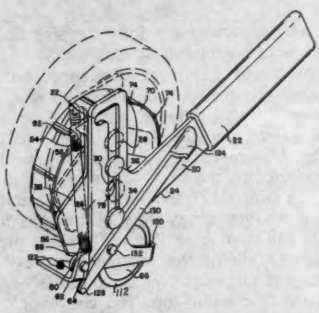
ment of a carriage for the corresponding guide roller and the trailing end of the preceding strip is trimmed by an auxiliary trimming device located between the splicing station and the other guide roller.

3,567,557

MASKING TAPE AND MASKING PAPER APPLICATOR

John D. Kingery, 4302 E. Vernon 85008, and Danny L. Pool, 4023 W. Alta Vista 85041, both of Phoenix, Ariz.

Filed Aug. 22, 1968, Ser. No. 754,698
Int. Cl. B32b *31/18, 31/20*
U.S. Cl. 156—523 **17 Claims**



A masking tape and masking paper applicator for manual application of masking tape and/or masking paper comprising a handle frame and a roller frame having common spring means for connecting the handle frame and the roller frame together, the roller frame being adapted to carry a roll of masking tape and the handle frame carrying a tape applicator roller in rotatably mounted relation thereon, the applicator roller having an enlarged bore mounted on a substantially smaller axle carried by the handle frame so that spring means tending to move the roller frame toward the applicator roller may force the roller to move laterally with relation to the axle on which the enlarged bore is mounted and whereby pressure of the applicator roller on a surface when applying tape permits the roller to move relative to the axle in a direction at right angles thereto and to deflect the roll of tape and the roller frame resiliently relative to the handle frame.

3,567,558

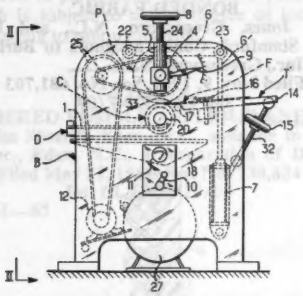
GELATINE-TRANSFER ENGRAVING MACHINE

Charles Walter Gemperlé, Villefranche-sur-Saone, France, assignor to Gillet Thaon (Societe Anonyme), Paris, France

Filed May 3, 1968, Ser. No. 726,314
Int. Cl. B32b *31/12*; B41l *25/02*
U.S. Cl. 156—555 **17 Claims**

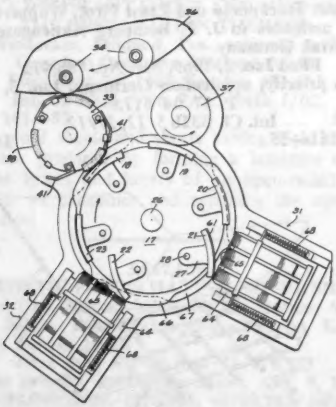
Apparatus for transferring a layer of exposed gelatine supported on a film of plastic material, especially of poly-

ester, onto a cylinder to be engraved. The machine comprises a rigid frame and bearings supporting a cylinder to be engraved. The bearings are movably mounted transversely on the frame between a predetermined working position and a displaced position for cleaning to a pressure roller adapted to be applied against the cylinder, is supported by bearings mounted in vertical guides arranged vertically in line with the working position of the bearings of the cylinder and pressure-control means are provided for lifting and lowering the pressure roller



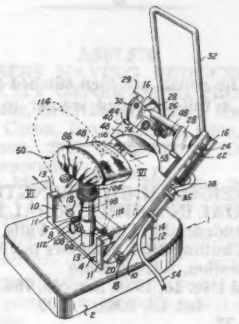
along the vertical guides and for applying a predetermined pressure from said roller onto the cylinder to be engraved. Driving control means are associated with the pressure roller in order to rotate said roller, and a feed table is intended to receive a layer of light-exposed gelatine carried by a plastic film and to permit the introduction of the film between the cylinder and the pressure roller for the purpose of winding and causing the film to adhere around the cylinder by the driving and pressing action of the pressure roller.

3,567,559
HIGH SPEED CONTAINER LABELING MACHINE
Karl Dullinger, Neutraubling, Germany, assignor to Hermann Kronseder, Neutraubling, Germany
Filed July 18, 1968, Ser. No. 745,778
Claims priority, application Germany, Aug. 17, 1967, K 63,114
Int. Cl. B65h *3/08*; B32b *31/20*
U.S. Cl. 156—571 **9 Claims**



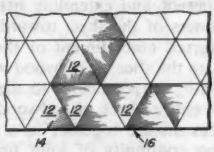
A high speed container labeling machine and apparatus to transfer labels from separate label magazines to a rotating label turret which applies the labels to the containers and in which multiple label magazines are disposed about the axis of an adhesive pad rotor which carries multiple groups of oscillatable adhesive pads disposed about the rotor axis, some of the pads constituting a pad group associated with one of the magazines and others of the pads constituting another pad group associated with another of said magazines, and means for oscillating said pads for coaction of each pad group with its associated label magazine.

3,567,560
PRESSING DEVICE
David C. Stiff, 2014 Greenville Ave., Dallas, Tex. 75206
Filed Aug. 9, 1968, Ser. No. 751,492
Int. Cl. B30b *15/34*; A47j *51/22*
U.S. Cl. 156—583 **16 Claims**



A letter pressing device having a heating element slidably disposed on arms pivotally mounted on a base plate whereby the heating element is moved horizontally and vertically into overlying relation with the garment and then moved downwardly by cams to press the garment.

3,567,561
DIFFRACTION TYPE MOSAIC SYSTEM
Remsen V. Wood, Riderwood, Md. 21139
Continuation-in-part of application Ser. No. 467,312, June 28, 1965. This application Jan. 9, 1969, Ser. No. 797,324
Int. Cl. B44f *1/02*
U.S. Cl. 161—34 **7 Claims**



Means and method for producing co-ordinate spectra from randomly arrayed mosaics of diffraction gratings by using curved-line gratings, and for increasing the efficiency of spectrum production by circular gratings by using arrays of parts of the gratings in selected structural organization.

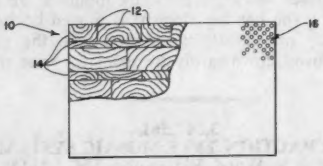
3,567,562
KNITTED CASING FOR INFLATABLE BLADDER
Barnett D. Gordon, Brookline, and Steve E. Soltis, Worcester, Mass., assignors to M.K.M Knitting Mills, Inc., Manchester, N.H.
Filed Sept. 27, 1967, Ser. No. 670,839
Int. Cl. B32b *3/10*
U.S. Cl. 161—7 **3 Claims**

A knitted casing is provided for a bladder which, when inflated, has the shape of a solid of revolution, e.g., an elongated neck terminating in an approximately spherical

bulge of much larger diameter. The casing is made by knitting panels on a full-fashioned knitting machine in such a manner as to produce in each panel the curvature

of the bulge. The panels are then stitched together along their edges by a full-fashioned seamer to complete the casing.

3,567,563
LIGHTWEIGHT, HIGH STRENGTH CORE MATERIAL IN A STRUCTURAL PANEL
Charles A. Haudenchild, Cuyahoga Falls, and Nicholas G. Sandru, Canton, Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio
Filed Dec. 26, 1968, Ser. No. 786,910
Int. Cl. B32b *21/00*
U.S. Cl. 161—37 **5 Claims**



A lightweight, high strength sandwich core material which is in a substantially flat sheet form having a plurality of uniformly spaced holes positioned perpendicular to one surface thereof and extending between 85% and 95% of the thickness of the sheet towards the other surface. In the preferred embodiment of the invention, the material making up the sheet is redwood with the grain of the redwood running perpendicular to the surfaces thereof, and with the entire sheet of redwood made up of a plurality of blocks mosaic together in a random pattern where there is no continuity of joint lines. The core is normally sandwiched between out skins or facings and intimately fixed to each other. The continuous surface of the core is positioned to receive most impact and compressive forces. The positioning of the core determines the most impact resistant surface.

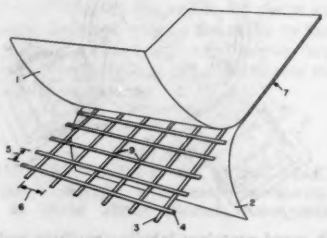
3,567,564
FLEXIBLE SHEET AGGLOMERATE UTILIZABLE IN FOUNDRY
Lars Rydberg, Uranus Vager 8, Skalby, Sweden
No Drawing. Filed July 13, 1967, Ser. No. 653,023
Claims priority, application Monaco, July 14, 1966, 632.67.602; June 7, 1967, 49
Int. Cl. B22d *7/10;* **B32b** *1/04*
U.S. Cl. 161—44 **1 Claim**

An insulating sheet for foundry practice, such as an ingot mold lining, is in the form of a flexible sheet of sand and vegetable flour agglomerated with a binder, and optionally also an exothermic material and one or more inorganic insulating materials. The sheet has a thickness of 2 to 12 mm. and has adhesive on one side to hold it to the mold. The sheet has a bevel on at least one edge, that faces away from the side that bears the adhesive, thereby to avoid formation of shoulders on the ingot that would roll out to imperfections.

3,567,565
LAMINATE OF FOAM AND STITCH BONDED FABRIC
Robert L. Jones, Greensboro, N.C., and Robert E. Provost, Stamford, Conn., assignors to Burlington Industries, Inc., Greensboro, N.C.
Filed Nov. 9, 1967, Ser. No. 681,703
Int. Cl. B32b *7/04*
U.S. Cl. 161—50 **6 Claims**

A warp knitted fabric comprising loose filling threads held together by chain stitches of sewing thread which gather the filling threads into clusters separated by spaces where the stitches pass through the fabric. The fabric is laminated with a foamed polymeric material which is fluid or becomes fluid during the process so that it can flow into the spaces between clusters of filling threads and interlock with them and the sewing thread. After flowing into position while fluid the foam is gelled and, if necessary, cured to take on its permanent configuration.

3,567,566
COMPOSITE REINFORCED THERMOPLASTIC FOIL LAMINATE
Werner Bandel, Wuppertal, Herbert Hilpert, Schwelm, and Hans Treckmann and Ernst Pirot, Wuppertal, Germany, assignors to J. P. Bemberg Aktiengesellschaft, Wuppertal, Germany
Filed Jan. 2, 1969, Ser. No. 788,472
Claims priority, application Germany, Jan. 3, 1968, P 17 04 517.9
Int. Cl. B32b *5/12, 27/12*
U.S. Cl. 161—55 **24 Claims**



A composite thermoplastic foil consisting of two outer foil sheets interconnected by an adhesive between which

there is inserted a grid-shaped or latticed planar reinforcing structure which consists of longitudinally stretched narrow foil strips laid in a criss-cross pattern at spaced substantially parallel intervals, the individual strips having a thickness of not more than 100 microns and a width of approximately 1 to 6 mm. with a spaced interval between individual pairs of strips of at least 1.5 times the width of the strips. It is particularly desirable to provide foil strips having a proportionately higher elongation at break, breaking strength and elastic strain value but a lower ductility than the outer foil sheets. The resulting composite foil is particularly useful as a packaging material which is subject to a high degree of local stresses or forces tending to rupture the foil.

3,567,567

EMBROIDERED FUSIBLE APPLIQUE AND FABRIC

Ernest Kohn Sherrill, Eden, N.C., assignor to Fieldcrest Mills, Inc., Eden, N.C., a corporation of Delaware

Filed May 21, 1968, Ser. No. 730,834
Int. Cl. D03d *27/08*
U.S. Cl. 161—67 **11 Claims**

An embroidered appliqué whose bottom surface is formed from composite yarn having at least two plied strands, the first of which has a relatively low fusion point. The other strand and the applique are nonfusible when subjected to heat at or substantially above the temperature of the fusion point of the first strand so that, even though the continuity of the first strand may be interrupted by having been melted during fusing of the appliqué to a supporting fabric, the second strand remains intact and will maintain the structural integrity of the applique fused to the fabric even after the fabric has been subjected to many launderings.

3,567,568

IMPACT RESISTANT SHEET AND METHOD FOR THE PREPARATION THEREOF

Leo J. Windecker, Midland, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sept. 29, 1967, Ser. No. 671,791
Int. Cl. B32b *5/26, 7/02;* **B41k** *1/02*
U.S. Cl. 161—93 **5 Claims**

Bullet proof sheets and sheets having high impact resistance are prepared by forming a laminate of resin-glass fiber layers and layers of an open-celled flexible foam with an elastomer and retaining the open-celled configuration.

3,567,569

SYNTHETIC FIBERS HAVING NOVEL SHAPE

Terumichi Ono, Shigeru Mizutani, and Hazime Arai, Nagoya, Japan, assignors to Toyo Rayon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 4, 1966, Ser. No. 570,325
Claims priority, application Japan, Aug. 9, 1965, 40/48,040; Nov. 15, 1965, 40/69,783; July 22, 1966, 41/47,670
Int. Cl. D02g *3/00, 3/34*
U.S. Cl. 161—179 **6 Claims**

Synthetic, molecularly oriented fibers of fine pitch and having large concavities and convexities comprising a melt-spinnable synthetic polymer having a single continuous male screw shape wherein the ratio of pitch to outer

diameter of the screw thread is within the range of 0.3 to 15, and the ratio of height to outer diameter of said thread is in the range of from 0.03 to 0.4.

3,567,570

GLASS FIBERS HAVING REDUCED STATIC ELECTRICITY GENERATING PROPERTIES

Jerome A. Preston, Granville, Michael J. Harvey, Newark, and Leo P. Caron, Reynoldsburg, Ohio, and Carl C. Rue, Anderson, S.C., assignors to Owens-Corning Fiberglas Corporation

No Drawing. Filed Aug. 14, 1967, Ser. No. 660,230
Int. Cl. B32b *17/04;* **C03c** *25/02*
U.S. Cl. 161—193 **6 Claims**

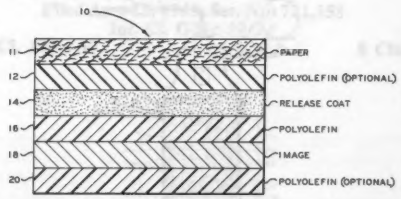
A polyester panel reinforced with chopped glass fibers coated with a mixture of particles of a non-ionic organosiloxane, a compatible film forming resin, and a coupling agent from the group of metal oxides, Werner complexes, and organosilanes.

3,567,571

LAMINATED STRUCTURE FOR HOT APPLICATION OF AN IMAGE TO A THERMOPLASTIC RESIN ARTICLE

Robert J. Martinovich, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Nov. 14, 1967, Ser. No. 682,775
Int. Cl. B32b *27/10;* **B44c** *1/16*
U.S. Cl. 161—206 **4 Claims**



A heat transfer laminated structure for hot application to a thermoplastic resin article is provided, said structure comprising a paper substrate, which may be coated with a resin, a coating of a heat release agent bonded to said substrate, a film of a thermoplastic resin compatible with the resin of said article bonded to the heat release coating, and an image to be transferred imposed on only a portion of the film of resin. The image may be applied either before or after applying the resin film to the release agent on the coated or uncoated substrate. When applying the resin film before application of the image, it is preferred to apply a second resin film over the image to protect the image by sandwiching it between the films of resin. Heat and pressure are used to transfer the image and film or films of resin to the resin article.

ERRATUM

For Class 162—2 see:
Patent No. 3,566,956

3,567,572

POLYSULFIDE LIQUOR IMPREGNATION OF LIGNOCELLULOSE MATERIALS IN A MULTI-STAGE PULPING PROCESS

David W. Clayton, Hudson, Quebec, and Asahi Sakai, Cite de Lasalle, Quebec, Canada, assignors to Pulp and Paper Research Institute of Canada, Pointe Claire, Quebec, Canada

No Drawing. Filed Sept. 6, 1967, Ser. No. 665,710
Int. Cl. D21c *3/26*
U.S. Cl. 162—19 **17 Claims**

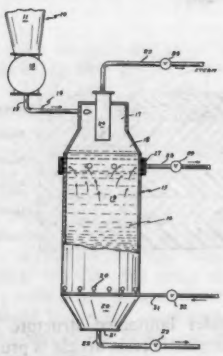
A process for the production of celluloisic pulp from lignocellulosic materials including the steps of impregnating the materials with a polysulfide liquor at a temperature below that at which substantial decomposition of the polysulfide occurs, removing excess of polysulfide liquor from the impregnated materials, increasing the temperature and adjusting the pH from the impregnation step to prevent alkaline degradation of the material, and cooking the impregnated material with a cooking liquor containing sodium hydroxide to substantially delignify said material.

3,567,573

DIGESTER DISCHARGE SYSTEM

Philip D. Case, Turin, Italy, assignor to The Bauer Bros. Co., Springfield, Ohio

Continuation of application Ser. No. 674,012, Oct. 9, 1969, which is a continuation of application Ser. No. 295,687, July 17, 1963. This application Sept. 25, 1968, Ser. No. 807,469
(Filed under Rule 47(b) and 35 U.S.C. 118)
Int. Cl. D21b *1/36;* D21c *7/00*
U.S. Cl. 162—22 **14 Claims**



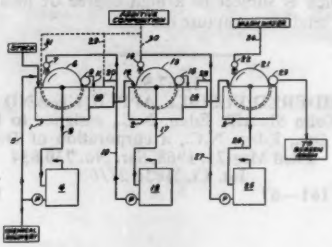
A process for simply refining fibrous materials such as wood chips characterized by a series related pair of vessels in the first of which the raw materials are fully saturated with conditioning fluids which substantially dissolve the bonding agents between their fibers without significantly affecting their shape and in the second of which the material is caused to automatically split to fiber form and be washed and cooled prior to exit to a blow tank or other holding or transition unit.

3,567,574

COMPOSITION AND METHOD FOR REDUCING FOAMING AND SODA LOSSES IN THE RECOVERY OF FIBROUS PARTICLES FROM AQUEOUS MEDIA

Leo D. Braitberg, Park Forest, Ill., and Donald C. Roylance, Potomac, Md., assignors to United States Movidyn Corporation, Chicago, Ill.

Filed July 26, 1967, Ser. No. 656,260
Int. Cl. D21c *3/28*
U.S. Cl. 162—70 **17 Claims**



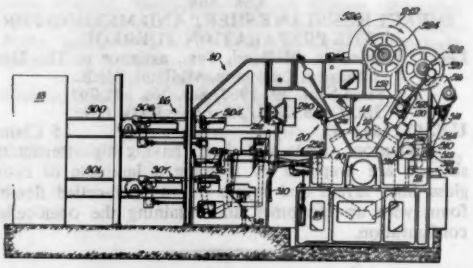
Compositions and methods for improving recovery of fibrous particles from aqueous media are provided which employ both a primary hydrophobic material, such as silicone-coated silica, and an additional hydrophobic material, such as dimethyldioctadecyl ammonium bentonite, dispersed in a low polarity oil for which the additional hydrophobic material is not a gellant. Even with solids contents up to 35% by weight, the compositions are pumpable liquids.

3,567,575

APPARATUS FOR PRODUCING FIBROUS PULP ARTICLES

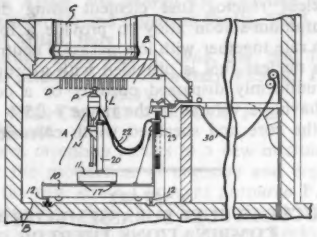
Richard L. Emery, Fairfield, Maine, assignor to Keyes Fibre Company, Waterville, Maine

Filed Apr. 6, 1967, Ser. No. 628,916
Int. Cl. D21j *3/10*
U.S. Cl. 162—387 **7 Claims**



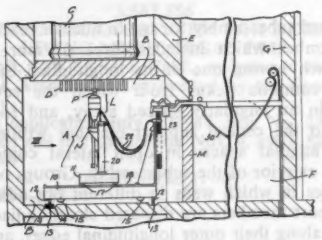
Apparatus for producing fibrous pulp articles comprising means for manufacturing the articles, means for conveying the articles to an article dryer, and means for transferring the articles from the manufacturing means to the conveying means, the article manufacturing means including a plurality of forming molds connected to a framework for rotation past spaced article processing stations, and indexing means connected to the framework for intermittently rotating the forming molds to the article processing stations.

3,567,576
NUCLEAR REACTOR INSTALLATION
Peter Isaac, Cooksville, Ontario, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Ontario, Canada
Filed Apr. 15, 1968, Ser. No. 721,293
Int. Cl. G21c 19/24
U.S. Cl. 176—30 19 Claims



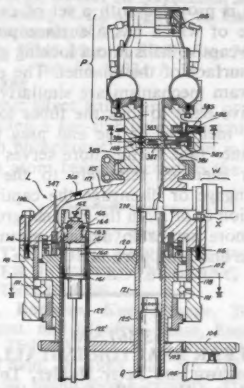
A T-coupling is provided between the fuel string and the closure plug assembly together forming a fuel aggregate for loading into each reactor fuel channel. A fuelling machine comprises a minimum of two barrels, one for receiving the fuel string and one for receiving the plug assembly, the barrels being disposed in a turret rotatable about an axis parallel to the barrels and the fuel channel. Intermediate engagement or disengagement of the coupling when loading or unloading a fuel channel is made by rotating the turret.

3,567,577
NUCLEAR REACTOR INSTALLATION
Gordon L. Brooks, Clarkson, Toronto, Ontario, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Ontario, Canada
Filed Apr. 15, 1968, Ser. No. 721,294
Int. Cl. G21c 19/24
U.S. Cl. 176—30 13 Claims



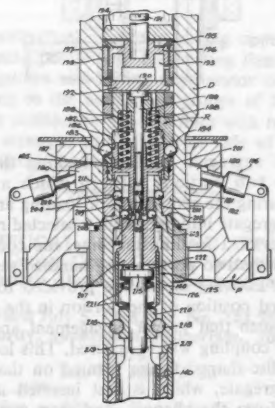
For loading and unloading fuel aggregates into and from a plurality of vertically extending fuel channels of the reactor, the snout of a fuelling machine head is coaxially aligned with a selected such channel, vertically shifted towards the channel and clamped onto a projecting end thereof. To carry out the necessary motions, a carriage is vertically shiftably mounted on a horizontally movable vehicle and supports a suspension assembly in which the machine head is rotatably mounted about a horizontal axis. The suspension assembly includes four vertically suspended rods connecting the machine head to the carriage, each rod having a universal joint at both ends to permit free horizontal translation of the machine head relative to the carriage, thus compensating for minor misalignments between the snout and the selected channel.

3,567,578
NUCLEAR REACTOR INSTALLATION
Peter Isaac, Cooksville, Ontario, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Ontario, Canada
Filed Apr. 15, 1968, Ser. No. 721,295
Int. Cl. G21c 19/24
U.S. Cl. 176—30 11 Claims



A fuelling machine head comprises an end wall with a snout for connecting reactor fuel channels and replenishment fuel transfer channels, a skirt portion, and a turret rotatably mounted in the skirt portion for supporting a number of tubes and aligning them with the snout. The tubes serve snugly to receive used and fresh fuel strings and a plug closing the channels. A fluid pressure-tight seal is disposed between the turret and the end wall so that the space defined within the turret is small in comparison with the volume of the tubes.

3,567,579
NUCLEAR REACTOR INSTALLATION
Peter Hubler and Roy K. Nakagawa, Toronto, Ontario, Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Ontario, Canada
Filed Apr. 15, 1968, Ser. No. 721,358
Int. Cl. G21c 19/24
U.S. Cl. 176—30 8 Claims



Each fuel aggregate used for fueling the reactor is locked and sealed within tis respective fuel channel by

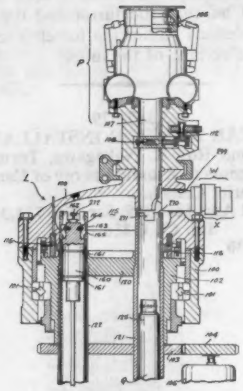
means of an end plug portion. For unlocking this portion, releasing the seal and displacing the fuel aggregate out of the channel, a mechanism is used which includes a casing for engaging the channel and two coaxial tubes for engaging the end plug portion. The two tubes are moved together along their longitudinal axis, relatively to the casing, and independently of this motion, the inner one of these tubes is moved along the same axis relatively to the outer tube. The end plug portion similarly comprises two coaxial tubular members, the outer one of which is provided with a set of captive balls and the inner one of which has a surface portion arranged to force these captive balls into a locking groove provided in the inner surface of the channel. The outer and inner tubes of the ram mechanism are similarly provided with a set of captive balls to lock the tubes to the outer and inner tubular members of the end plug portion respectively. The inner tube furthermore serves to displace the inner tubular member relatively to the outer tubular member to engage or disengage the captive balls of the end plug portion to or from the channel groove. The outer tube furthermore serves to actuate means for releasing the seal of the end plug portion.

3,567,580

NUCLEAR REACTOR INSTALLATION

Roy K. Nakagawa and Peter Hubler, Toronto, Ontario, and Peter Isaac, Cooksville, Ontario, Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Ontario, Canada

Filed Apr. 15, 1968, Ser. No. 721,410
Int. Cl. G21c *19/24*
U.S. Cl. 176—30 **11 Claims**



Each fuel aggregate used for fuelling the reactor is divided into two portions between which a coupling is provided. During the procedures of loading and unloading such fuel aggregate into and from a selected reactor channel by means of a fuelling machine, the coupling is disengaged and the two portions are handled separately and sequentially. Locking means are provided for defining a predetermined position of the portion in the fuelling machine head such that proper engagement and disengagement of the coupling will be insured. This locking means includes a disc-shaped flange formed on that portion of the fuel aggregate, which is first inserted into and last withdrawn from the channel, and stop means mounted in the fuelling machine for engaging the flange in a pincer-like manner.

3,567,581

URANIUM-SILICON FUEL ELEMENTS FOR A NUCLEAR REACTOR

Melville Albert Feraday, Deep River, Ontario, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Ontario, Canada

No Drawing. Continuation-in-part of application Ser. No. 647,246, June 19, 1967. This application June 4, 1968, Ser. No. 734,221
Int. Cl. G21c *3/30*
U.S. Cl. 176—70 **13 Claims**

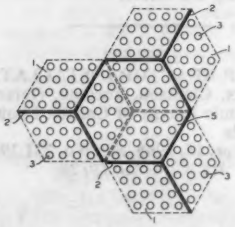
A nuclear reactor fuel element using delta phase (U_3Si) uranium-silicon alloy to provide a low aqueous corrosion rate together with low parasitic neutron absorption. The nuclear fuel is provided with a central hollow core or uniformly dispersed porosity or a combination of both having a volume in the range 3–25% of the volume of the core and sheathed width corrosion resistant material.

3,567,582

NUCLEAR FUEL SUBASSEMBLIES AND COMBINATIONS THEREOF

Jean-Paul L. Van Dievoet, Brussels, Jean George DeWandeleer, Overijsche, and Robert Odon Charles, Chatelet, Belgium, assignors to Societe Belge pour l'Industrie Nucleaire, S.A., "Belgonucleaire," Brussels, Belgium

Filed Feb. 23, 1968, Ser. No. 707,728
Claims priority, application Belgium, Feb. 23, 1967, 40,148
Int. Cl. E21c; E21b
U.S. Cl. 176—78 **7 Claims**



In a fuel subassembly for use in nuclear reactors, a support member which includes three or more elongated webs, each having one of its longitudinal edges joined with a common nexus from which the several webs radiate in an angularly spaced array, and fuel rods attached to the central support member within the thus-defined angular spaces in open lateral communication with the exterior of the subassembly. Groups of such subassemblies in which webs in different but adjoining central support members are disposed closely adjacent to one another along their outer longitudinal edges, and webs on a plurality of different central supports define cells containing fuel rods, thereby minimizing the amount of neutron-absorbing structural material required in each subassembly.

3,567,583

FERMENTATIVE PROCESS FOR THE PRODUCTION OF ERGOCRISTINE

Anacleto Minghetti, P.zza Vesuvio 23; Celestino Spalla, Via L. Soderini 21; and Luigi Tognoli, Via Fiordalisi 10, all of Milan, Italy

No Drawing. Filed July 2, 1968, Ser. No. 741,885
Claims priority, application Italy, Nov. 10, 1967, 22,538-A/67
Int. Cl. C12b *1/08*; C12k *1/10*
U.S. Cl. 195—81 **1 Claim**

The present invention relates to a microbiological process for the production of the ergot alkaloid ergocristine

employing the new microorganisms *Claviceps purpurea* F.I. S40 which also has been given the index number ATCC 20103 by the American Type Culture Collection, Rockville, Md. 20852, U.S.A.

3,567,584

PROCESS FOR THE PREPARATION OF ERGOCORNINE AND ERGOSINE

Alba Maria Amici, Via Morigi 13; Anacleto Minghetti, P.zza Vesuvio 23; and Celestino Spalla, Via L. Soderini 21, all of Milan, Italy

No Drawing. Filed July 2, 1968, Ser. No. 741,884
Claims priority, application Italy, Feb. 26, 1968, 13,195/68
Int. Cl. C12b *1/08*; C12k *1/10*
U.S. Cl. 195—81 **1 Claim**

The present invention relates to a new microbiological process for the production of ergosine and ergocornine employing the new strain *Claviceps purpurea* F.I. 43/14 which has also been given the index number ATCC 20106 by the American Type Culture Collection, Rockville, Md. 20852, U.S.A. By the process of the invention, good yields with a high purity of a mixture in practically equal parts of the alkaloids ergocornine and ergosine are obtained.

3,567,585

PROCESS FOR OBTAINING BCG-CULTURES

Hubert Bloch, Basel, and Jakob Nuesch, Riehen, Switzerland, assignors to Ciba Corporation, New York, N.Y.

No Drawing. Continuation-in-part of applications Ser. No. 379,364, June 30, 1964, and Ser. No. 455,994, May 14, 1965. This application June 27, 1968, Ser. No. 740,478
Claims priority, application Switzerland, July 12, 1963, 8,736/63; May 26, 1964, 6,839/64; May 27, 1964, 6,913/64; Mar. 25, 1965, 4,203/65
Int. Cl. C12k *5/00*
U.S. Cl. 195—96 **3 Claims**

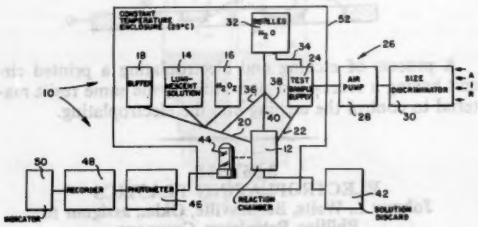
Process for cultivating BCG on an industrial scale in a fermenter by using a nutrient solution containing glycerin and a wetting agent of the Tween type and processing of the BCG culture to obtain vaccines.

3,567,586

CHEMILUMINESCENT SYSTEM FOR DETECTING LIVING MICROORGANISMS

Giorgio Soli, Los Angeles, Calif., assignor to the United States of America as represented by the Secretary of the Navy

Original application July 7, 1964, Ser. No. 380,958. Divided and this application Nov. 9, 1967, Ser. No. 688,294
Int. Cl. C12b *1/00*
U.S. Cl. 195—127 **5 Claims**



Apparatus is provided for continually monitoring the presence of living organisms in the atmosphere by pumping samples of air into a chamber wherein the sample is brought into contact with a compound of known luminescence. When microorganisms are persent in the sample a measurable attenuation of light output from the compound is detected and recorded.

3,567,587

PHOSPHOROUS-HALOGEN FOG STABILIZERS FOR PHOTOGRAPHIC EMULSIONS

Donald M. Burness, Robert A. Silverman, and Charles J. Wright, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Mar. 3, 1967, Ser. No. 620,244
Int. Cl. G03c *1/34*
U.S. Cl. 196—109 **18 Claims**

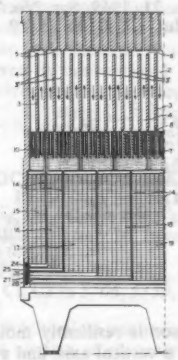
A photographic silver halide emulsion or photographic element containing a fog-stabilizing amount of an amide containing both phosphorus and halogen in the molecule, the phosphorus atom being attached to the amidic nitrogen atom.

3,567,588

REGENERATIVE COKE FURNACE WITH UPPER AND LOWER LOCATED BURNING POINTS IN THE HEATING FLUES

Artur Steding, Bochum, Kurt Prange, Dumberg-Hofe uber Hattingen, and Manfred Blase, Essen, Germany, assignors to Didier-Werke AG., Wiesbaden, Germany

Filed Sept. 26, 1968, Ser. No. 762,681
Claims priority, application Germany, Apr. 10, 1968, P 17 71 140.9
Int. Cl. C10b *5/02, 5/16*
U.S. Cl. 202—143 **4 Claims**



A regenerative coke furnace having upper and lower located burning points with the heating flues being combined into groups and having regenerator compartments corresponding to the number of groups of heating flues, which are in connection via sole flues with regulating devices being arranged at the exterior side of the furnace for regulating the flowing mediae.

3,567,589

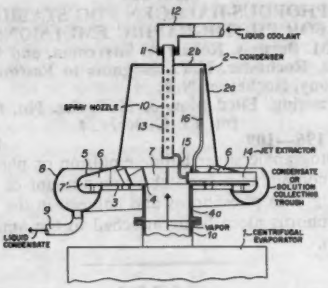
CENTRIFUGAL CONDENSING APPARATUS

Alain Javet, Grange-Canal, Geneva, Switzerland, assignor to The Battelle Development Corporation, Columbus, Ohio

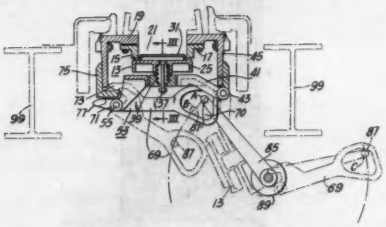
Filed July 5, 1968, Ser. No. 742,589
Claims priority, application Switzerland, July 4, 1967, 9,474/67
Int. Cl. B01d *3/08*
U.S. Cl. 202—189 **10 Claims**

A device for enabling a liquid to be discharged from a rotating chamber through an end opening formed in a casing portion thereof and for preventing a gaseous fluid from flowing through said opening in either direction,

which comprises the outer semitoric half of a toric channel with one opening of the channel directly and sealingly connected to said casing end opening and with the convex surface of the channel in a position radially more remote from the rotational axis of the chamber than said opening, a disc transverse to the axis extends radially into the channel so that, upon liquid being discharged from said casing end opening, said liquid first fills said channel to form a liquid plug before issuing at the other end of the channel. In a preferred embodiment the casing end opening and the channel extend, widthwise, circumferentially around the entire chamber.



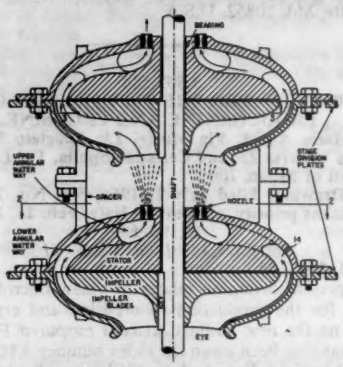
3,567,590
LEVELER DOOR AND OPERATING MECHANISM
Kurt Reinfeld and Emmanuel V. Gouye, Pittsburgh, Pa., assignors to Koppers Company, Inc.
Filed Jan. 21, 1969, Ser. No. 792,740
Int. Cl. C10b *25/12*
U.S. Cl. 202—248 **6 Claims**



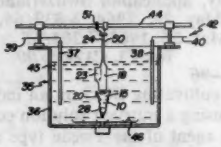
A leveler bar door is resiliently mounted to a frame which pivots about a vertical axis, and a latch is mounted to the door in biased relation to the door frame. A remotely controlled latch operating mechanism can be actuated to engage the latch to open and close the door when the leveler bar is aligned with the door opening.

3,567,591
METHOD FOR OPEN MULTICONDENSATION OF VAPORS FROM MULTIFLASH EVAPORATIONS
Donald F. Othmer, 333 Jay St., Brooklyn, N.Y. 11201
Continuation of application Ser. No. 652,368, June 12, 1968, which is a continuation-in-part of application Ser. No. 252,473, Jan. 18, 1963. This application Mar. 3, 1969, Ser. No. 809,457
Int. Cl. B01d *3/06;* **C02b** *1/06*
U.S. Cl. 203—26 **18 Claims**

Multiflash evaporation for concentrating solutions, and producing fresh water wherein vapors from a flash evaporator at a lower pressure is condensed and entrained in a colder stream of liquid sprayed through the open vapor space between two centrifugal pumps, the spray of condensing liquid and entrained vapors being directed into the suction eye of a first centrifugal pump thereby compressing the entrained vapors. The resultant condensing liquid and compressed vapors are then discharged as a second spray into the suction eye of a second co-acting centrifugal pump, the second spray passing through the open vapor space of the next higher pressure flash evaporation stage.



3,567,592
METHOD OF MAKING DENTAL RESTORATIONS
Horst L. Wismann, 260 E. 16th St., North Vancouver, British Columbia, Canada
Filed Sept. 16, 1968, Ser. No. 759,873
Int. Cl. C23b *7/02;* **C23f** *17/00*
U.S. Cl. 204—9 **7 Claims**



Dental restorations are manufactured by electroplating a ceramal substructure on a die which duplicates the tooth structure to be restored and subsequently applying a porcelain outer layer to the ceramal substructure.

3,567,593
PROCESS OF ETCHING AND ELECTROPLATING PRINTED CIRCUITS
George G. Burlingame, Stillwater, Minn., assignor to Buckbee-Mears Company, St. Paul, Minn.
Filed Sept. 17, 1968, Ser. No. 760,339
Int. Cl. B29c *17/08;* **C23b** *5/48*
U.S. Cl. 204—15 **3 Claims**

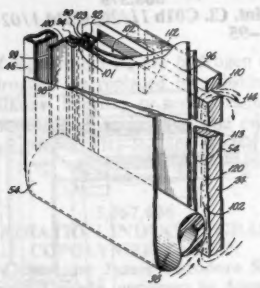
A process of etching and electroplating a printed circuit having a recessed region utilizing the same resist material to control the etching and the electroplating.

3,567,594
ELECTROPLATING PLASTICS
Johnny L. Wells, Bartlesville, Okla., assignor to Phillips Petroleum Company
No Drawing. Continuation-in-part of application Ser. No. 714,098, Mar. 18, 1968. This application Mar. 17, 1969, Ser. No. 807,986
Int. Cl. B29c *25/00;* **C23b** *5/64*
U.S. Cl. 204—20 **36 Claims**

Electroplating of a moldable plastic containing a siliceous filler is achieved by conditioning a preformed arti-

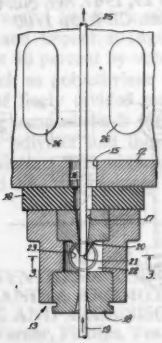
cle of said plastic by a combination treatment consisting of an acid chromate etch and an HF treatment and thereafter preplating the conditioned article with an electrolessly platable metal and electroplating the preplated article with a final finish to obtain a metalplated plastic product.

3,567,595
ELECTROLYTIC PLATING METHOD
Charles B. Yates, Willingboro, N.J., assignor to Circuit Foil Corporation, Bordentown, N.J.
Filed Sept. 25, 1967, Ser. No. 670,152
Int. Cl. B01k *3/00;* **C23b** *5/58*
U.S. Cl. 204—28 **9 Claims**



A method of improving the electroplating of a metal onto the surface of a cathodic strip of metal which is moved in the electrolyte in proximity to the surface of an anode, said method involving the creation of a substantially uniform upward flow of electrolyte across the surface of said strip of metal using gas evolved between the anode and said strip of metal as the driving force for a pumping system to create an air lift effect. Apparatus for carrying out said method.

3,567,596
ELECTROLYTICALLY COPPER PLATING AN ALUMINUM WIRE
William D. Kelly, 12 Blodgett St., Clarendon Hills, Ill. 60514
Continuation-in-part of application Ser. No. 718,399, Apr. 3, 1968. This application Aug. 19, 1968, Ser. No. 755,504
Int. Cl. C23b *5/18, 5/48, 5/68*
U.S. Cl. 204—28 **3 Claims**



The invention relates to an apparatus for electrolytically plating wire. The apparatus is particularly useful in copper plating of aluminum wire and includes means whereby the outer layer of aluminum oxide may be stripped from the aluminum wire immediately prior to immersion of the wire into the electrolytic solution so as to inhibit the formation of aluminum oxide coating on the stripped wire.

3,567,597
METHOD OF MAKING A DRY LUBRICANT COATING
Ralph J. Hovey, Glen Ellyn, and Afsar A. Khan, Elmhurst, Ill., assignors to The Bunker-Ramo Corporation, Oak Brook, Ill.
No Drawing. Original application Jan. 13, 1966, Ser. No. 520,360. Divided and this application June 11, 1969, Ser. No. 832,476
Int. Cl. B01k *5/02;* **C23f** *17/00*
U.S. Cl. 204—38 **4 Claims**

A metal such as tin, aluminum or magnesium is electrolytically anodized and simultaneously therewith there is electrophoretically deposited particles of a solid lubricant on the metal. All types of solid lubricant particles which normally have or can be made to have a negative charge may be used, including molybdenum disulphide, alumina-tungsten disulphide, polyethylene, and fluorocarbon polymers.

3,567,598
RENDERING THE SURFACE OF MOLYBDENUM AND TUNGSTEN COMPOSITIONS SOFT-SOLDERABLE
Newell C. Cook, Schenectady, N.Y., assignor to General Electric Company
No Drawing. Continuation-in-part of application Ser. No. 593,324, Nov. 10, 1966. This application June 23, 1969, Ser. No. 835,737
Int. Cl. C23b *5/14;* **C23f** *17/00*
U.S. Cl. 204—38 **6 Claims**

Molybdenum and tungsten can be tinided in a fused salt bath. The surfaces so produced are readily wet by molten soft solder and, therefore, such surfaces can be readily soft-soldered by conventional soft-soldering techniques to themselves or to other objects which can be soft-soldered.

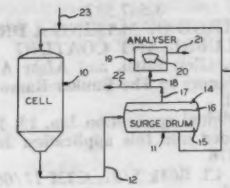
3,567,599
ELECTROCHEMICAL TREATMENT OF FERROUS METAL
William A. Carter, Jr., Gary, Ind., and Harvie H. Lee, Park Forest, Ill., assignors to Inland Steel Company, Chicago, Ill.
No Drawing. Filed June 21, 1967, Ser. No. 647,619
Int. Cl. C23b *5/06, 5/50, 11/00*
U.S. Cl. 204—41 **6 Claims**

A two-step electrochemical treatment of a ferrous metal article in which a coating of electrolytic chromium plate is deposited on a ferrous metal surface and a surface coating containing chromium as an oxide of chromium and metallic chromium is codeposited over the chromium plate from a chromic acid solution containing an electroplating additive, preferably a halide ion. By controlling the thickness of each of the coatings, a duplex coating is formed which imparts good corrosion resistant and good lacquer-adherent properties to the ferrous metal article without imparing the formability thereof; thereby making the electrochemical treatment and the resultant product particularly suited for the production of tinless can stock.

3,567,600
METHOD OF MEASURING THE ALKYL CHLORIDE CONCENTRATION IN AN ELECTROLYTE
Alfred O. Walker, Lake Jackson, Tex., assignor to Nalco Chemical Company, Chicago, Ill.
Filed Aug. 8, 1969, Ser. No. 848,436
Int. Cl. B01k *3/00*
U.S. Cl. 204—59 **9 Claims**

The alkyl chloride concentration in the electrolyte of an electrolytic cell is measured and/or recorded by determining the concentration of the chloride in the gas phase

of the electrolyte. The gas phase is analyzed by an infrared analyzer which is sensitive to the chloride, and calibrated to read out the weight percent of chloride in the liquid phase of the electrolyte.



3,567,601
PROCESS FOR POLYMERIZING TETRAHYDROFURAN

Kenneth R. Lucas, James F. Cetnar, and Edward L. Kay, Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

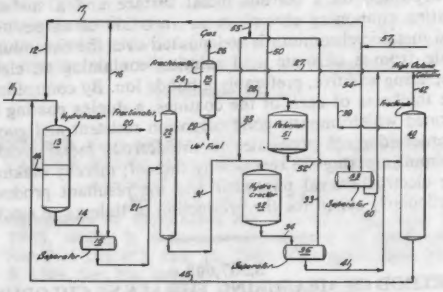
No Drawing. Filed Sept. 12, 1968, Ser. No. 759,504
Int. Cl. C07b *3/00, 29/06*
U.S. Cl. 204—78 11 Claims

The process described herein comprises an electrolytic method for polymerizing tetrahydrofuran to polytetramethylene oxide using as the electrolyte an alkali metal perchlorate or an ammonium perchlorate. The polymerization is effected in the anodic compartment of an electrolytic cell. Other monomers such as styrene or other vinyl monomers, including dienes such as isoprene, 1,3-butadiene, etc., can be polymerized simultaneously, if desired, in the cathodic compartment of the cell and using either the same perchlorate or other electrolyte in the cathodic compartment.

3,567,602
PRODUCTION OF MOTOR AND JET FUELS

Edward T. Child, Fishkill, and Donald A. Messing, Wappingers Falls, N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Feb. 29, 1968, Ser. No. 709,484
Int. Cl. C10g *23/00*
U.S. Cl. 208—89 9 Claims

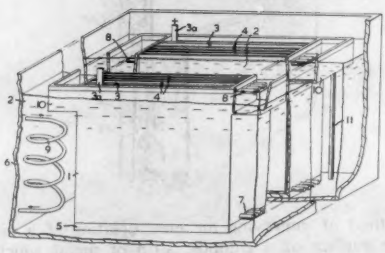


Simultaneous production of high quality motor and jet fuels is accomplished by passing a hydrocarbon feed through a hydrotreating zone, removing motor fuel and jet fuel from the effluent, passing a fraction boiling above the jet fuel range to a hydrocracking zone, recovering from the hydrocracking zone effluent a high quality motor fuel and recycling the jet fuel and heavier fraction to the hydrotreating zone.

3,567,603
REDUCTION OF CORROSION IN THE ELECTROLYTE SURROUNDING A MULTIPOLAR CELL

George J. Crane, Islington, Ontario, Canada; Ernest A. Du Vernet and Selma L. Crane, executors of the last will of said George J. Crane, deceased, assignors to Huron Nassau Ltd., Nassau, Bahamas

Continuation-in-part of abandoned application Ser. No. 362,718, Apr. 27, 1964. This application Mar. 5, 1968, Ser. No. 710,477
Claims priority, application Canada, Nov. 5, 1963, 888,376
Int. Cl. C01b *11/26*; C22d *1/02*
U.S. Cl. 204—95 3 Claims

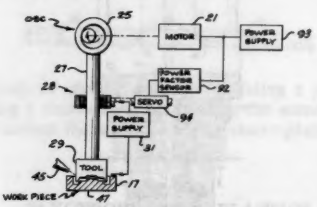


In the production of sodium chlorate or perchlorate a method of reducing corrosion of electrically conductive parts, particularly cooling coils, in a tank surrounding a multipolar electrolytic cell, said tank containing an aqueous solution of sodium chloride as electrolyte from which the electrolyte is continuously recirculated through the cell which method comprises intimately admixing the effluent electrolyte from each cell unit from the cell prior to its passage to the tank whereby to obtain equalization of the electric potential in the effluent.

3,567,604
USE OF SONIC RESONANT ENERGY IN ELECTRICAL MACHINING

Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif. 91406

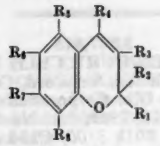
Filed May 29, 1967, Ser. No. 642,085
Int. Cl. B23p *1/00*
U.S. Cl. 204—143 2 Claims



A device and method for electrical machining which consists of applying sonic energy to the work tool element. The work tool is resonantly vibrated so that a wave pattern is transmitted to the tip thereof adjacent the workpiece and is transmitted through the working fluid to the workpiece.

3,567,605
PHOTOCHEMICAL PROCESS
Ralph S. Becker, 518 Knipp, Houston, Tex. 77024
No Drawing. Filed Mar. 30, 1966, Ser. No. 542,429
Int. Cl. B01j *1/10, 1/12*
U.S. Cl. 204—158 7 Claims

A photochemical system employing chromene or its derivatives having the general formula:



where any of R_1 through R_8 are hydrogen or where one or more hydrogens are replaced by substitution with an alkyl, aryl, alkoxy, hydroxy or amino radical or are replaced by condensation across any one or more of the positions R_3–R_4; R_5–R_6; R_6–R_7; and R_7–R_8.

3,567,606
RADIATION INDUCED GRAFT COPOLYMERIZATION
Sharda Das Gupta and James Theodore Slobodian, Ottawa, Ontario, Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Ontario, Canada
No Drawing. Continuation of application Ser. No. 338,625, Jan. 20, 1964. This application Jan. 8, 1968, Ser. No. 696,483
Claims priority, application Canada, July 24, 1963, 880,898
Int. Cl. B01j *1/10, 1/12*
U.S. Cl. 204—159.12 17 Claims

In the process of graft polymerization by the use of high energy radiation the improvements comprising covering the material to be grafted with an outer layer wherein homopolymerization is minimized in the inner layer by the presence of said outside layer.

3,567,607
IRRADIATED METAL-POLYMER COMPOSITIONS
Frank L. Saunders, James K. Rieke, and James W. Twining, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Feb. 18, 1966, Ser. No. 528,348
Int. Cl. B01j *1/10, 1/12*
U.S. Cl. 204—159.2 10 Claims

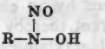
A composition useful for fabricating an article having improved tensile and impact strength, said composition comprising at least 40 percent by volume of an irradiated olefin polymer such as polyethylene and at least 40 percent by volume of finely divided metallic particles such as aluminum. The composition is prepared by dry blending the irradiated polymer and the metallic particles to form a uniform mixture. The mixture is then formed into the article desired by, for example, a suitable molding technique.

3,567,608
MERCAPTAN SYNTHESIS USING ULTRAVIOLET RADIATION AND A PROMOTER CONTAINING A PHOSPHITE AND AZOBISISOBUTYRONITRILE
Paul F. Warner, Phillips, Tex., assignor to Phillips Petroleum Company
Filed Apr. 29, 1968, Ser. No. 725,097
Int. Cl. B01j *1/10*; C07c *3/24*
U.S. Cl. 204—162 9 Claims

The reaction rate and conversion of ethylenically unsaturated compounds and hydrogen sulfide carried out in the presence of ultraviolet radiation is improved by the utilization in the reaction system of a combination promoter consisting of a phosphite of the formula $(ArO)_3P$ and azobisisobutyronitrile.

3,567,609
PHOTOLYTIC PRODUCTION OF N-SUBSTITUTED N-NITROSOHYDROXYLAMINES
Martin Pape and Paul Raff, Ludwigshafen (Rhine), Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany
No Drawing. Filed Oct. 20, 1967, Ser. No. 676,692
Claims priority, application Germany, Oct. 27, 1966, P 15 43 376.8
Int. Cl. B01j *1/10*
U.S. Cl. 204—162 4 Claims

A process for the production of N-substituted N-nitrosohydroxylamines having the formula:

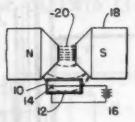


in which R denotes an alkyl, cycloalkyl or aralkyl radical, by reacting a hydrocarbon R—H (in which R has the said meaning) with NO and HCl in the presence of light at temperatures of from −100° C. to +100° C. at a pressure of up to 2 atmospheres absolute.

3,567,610
PRODUCTION OF CHLORINATED PARAFFINS
John E. Krol, Moon Township, and Albert J. Henderson, Coraopolis, Pa., assignors to Neville Chemical Company, Pittsburgh, Pa.
No Drawing. Filed June 24, 1968, Ser. No. 739,177
Int. Cl. C07c *17/10*
U.S. Cl. 204—163 25 Claims

Paraffin hydrocarbons are chlorinated in the presence of a minor amount of an additive capable of overcoming contamination present in the reaction zone which would otherwise retard the chlorination reaction. The additives utilized in the process are ferrocyanic acid, ferricyanic acid, and ferrocyanides or ferricyanides of ammonia, Group I metals, or Group II metals.

3,567,611
TWO-STAGE ELECTROMAGNETOPHORESIS
Richard E. Michel, Birmingham, and Robert M. Nalbandian, Bloomfield Hills, Mich.; said Michel assignor to General Motors Corporation, Detroit, Mich.
Filed Sept. 16, 1968, Ser. No. 759,884
Int. Cl. B01k *5/00*
U.S. Cl. 204—180 7 Claims



Material, such as human normal blood serum protein, is partitioned by two-stage electromagnetophoresis as a function of molecular paramagnetism. In the first stage the protein to be partitioned is positioned on a prism of gel and is electrophoresed to provide a first partition thereof in the direction of the applied electric field in accordance with physical and electrical characteristics thereof. Following the completion of the electrophoresis, the prism is placed in a non-uniform magnetic field and magnetophoresed. The proteins suspended in a partitioned state in the gel matrix as the result of electrophoresis are

thus partitioned in a direction parallel to the magnetic field gradient as a function of the paramagnetism of the molecules of the protein.

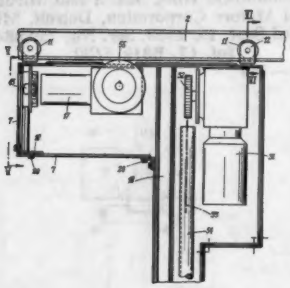
3,567,612
ELECTROLYTIC COATING OF N - 3 - OXOHYDROCARBON-SUBSTITUTED ACRYLAMIDE POLYMER
Andrew G. Tsuk, Laurel, Md., assignor to W. R. Grace & Co., New York, N.Y.
No Drawing. Filed Oct. 26, 1967, Ser. No. 678,195
The portion of the term of the patent subsequent to Mar. 25, 1986, has been disclaimed
Int. Cl. B01k *5/02*; **C23b** *13/00*
U.S. Cl. 204—181 **16 Claims**

A process for coating metallic electrodes comprising contacting said electrodes with an aqueous acidic solution of an N-3-oxohydrocarbon-substituted acrylamide under ambient conditions by an electrolysis process employing alternating current thereby forming an N-3-oxohydrocarbon-substituted acrylamide polymer coating on the electrodes.

3,567,613
METHOD FOR FLAMEPROOFING COMBUSTIBLE MATERIALS
John W. Kraus, Fairfax, Va., and Jose E. Herrera, Ellicott City, Md., assignors to W. R. Grace & Co., New York, N.Y.
No Drawing. Filed May 10, 1968, Ser. No. 728,357
Int. Cl. B01k *5/02*
U.S. Cl. 204—181 **8 Claims**

A process for flameproofing combustible materials by electrodepositing vermiculite from an aqueous solution of an alkali metal salt onto said materials.

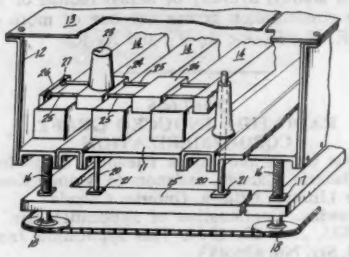
3,567,614
HANDLING APPARATUS FOR ELECTROPLATING INSTALLATIONS
Robert Vauriac, Taverny, France, assignor to Les Procedes Rovac, Villeneuve-la-Garenne, Hauts-de-Seine, France
Filed May 16, 1968, Ser. No. 729,586
Claims priority, application France, May 31, 1967, 108,519; Apr. 24, 1968, 149,186
Int. Cl. B65g *49/00*; **C23b** *5/68*
U.S. Cl. 204—202 **2 Claims**



A handling aparatus which is primarily intended for use in electroplating installations and serves to lower parts to be treated into a plating tank, to withdraw said parts therefrom and to convey them to the following tank. The apparatus is constituted by a frame suspended from an overhead track mounted above the plating tanks and said frame is made up of a vertical extension along which a part-holding support is capable of moving. According to the invention, the vertical frame extension is protected by a shield casing constituting a practically sealed enclosure in which is mounted a vertically movable carriage fitted with said part-holding support and adapted to extend beyond the shield casing through at least one longitudinal slit formed in said casing.

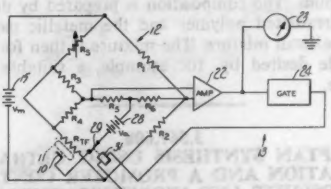
The frame is also protected by a shield casing which is jointed to the shield casing of the vertical frame extension and houses the units for the propulsion and control of the carriage on which the part-holding support is mounted.

3,567,615
MERCURY CELL
Bernard H. Nicolaisen, Stamford, Conn., assignor to Olin Corporation
Filed Jan. 22, 1969, Ser. No. 792,948
Int. Cl. B01k *3/00*; **C22d** *1/04*
U.S. Cl. 204—219 **13 Claims**



The novel flowing mercury cathode electrolytic cell has an improved bottom with alternate bare and insulated lengthwise segments, anodes above the bare segments, and adjustable support means for the anodes extending through insulating sleeves in the insulated segments of the cell bottom to adjustment means below the cell bottom. The top and sides of the cell are advantageously constructed of light weight materials since they do not have to support the anodes and anode adjustment means.

3,567,616
CIRCUIT FOR SIMULTANEOUSLY ANODIZING AND MEASURING THIN-FILM RESISTORS
Thomas L. Crisman, Alexandria, Va., and Robert C. Ward, Winston-Salem, N.C., assignors to Western Electric Company, Incorporated, New York, N.Y.
Filed Nov. 18, 1968, Ser. No. 776,592
Int. Cl. B01k *3/00*
U.S. Cl. 204—228 **3 Claims**



A thin-film resistor, which is to be anodized to increase its resistance to a preselected value, is connected as one arm of a bridge circuit. A pair of equal series connected balancing resistors are connected across the measuring diagonal of the bridge while a D.C. source of

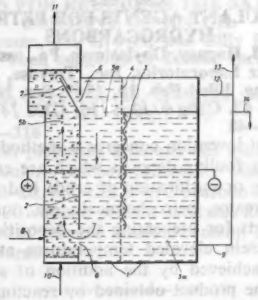
measurement voltage is connected across the opposite diagonal. A source of D.C. anodizing current is coupled to the thin-film resistor through an electrolyte and to the junction between the pair of balancing resistors. When the bridge is balanced, the anodization current flows in two equal halves, in opposite directions through the balancing resistors so that a balance detector connected across the balancing resistors is unaffected by the flow of anodization current.

3,567,617

PROCESS FOR THE PRODUCTION OF OLEFIN OXIDES

Walter Krönig and Peter Konrad, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 12, 1967, Ser. No. 674,783
Claims priority, application Germany, Oct. 14, 1966, F 50,440
Int. Cl. B01k *3/10*
U.S. Cl. 204—265 **11 Claims**



Process for electrolytically forming olefin oxides in an electrolytic cell having an anode, a diaphragm, and a cathode with the following compartments: an anode compartment divided into an anode backside compartment and an intermediate zone or compartment between the anode and the diaphragm and a cathode compartment; wherein gasiform olefin and metal halide-containing electrolyte are introduced into the cell and reacted therein to produce the desired olefin oxide; the improvement of introducing the gasiform olefin only into the anode backside compartment and preventing substantial quantities of gasiform olefin from being present in the intermediate zone.

3,567,618

FLUORIDIZED GRAPHITE AND METHOD OF MANUFACTURE THEREOF

Louis Foulletier and Roland Bachelard, Lyon, France, assignors to Ugine Kuhlmann, Paris, France

No Drawing. Filed Oct. 23, 1967, Ser. No. 677,071
Claims priority, application France, Oct. 24, 1966, 81,279
Int. Cl. B01k *3/08*
U.S. Cl. 204—294 **10 Claims**

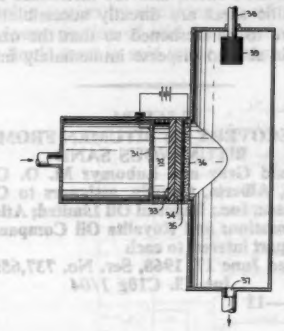
Graphite and articles manufactured therefrom may be fluoridized to an extent hitherto unattainable by subjecting the graphite to repeated fluoridation cycles until the desired degree of fluoride penetration is achieved. Each fluoridation cycle comprises the steps of (a) degasing the graphite under vacuum, (b) contacting the graphite with fluorine gas under reduced pressure and at an elevated temperature, and (c) removing the fluorine gas from contact with the graphite.

3,567,619

ELECTROSTATIC COALESCENCE MEANS

Robert N. Brown, Alexandria, Va., assignor to the United States of America as represented by the Secretary of the Army

Filed June 3, 1968, Ser. No. 734,033
Int. Cl. B01k *1/00*; B03c *5/02*; C10g *33/02*
U.S. Cl. 204—302 **2 Claims**



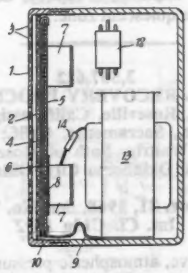
This invention relates to hydrocarbon fuel filtration and, more particularly, to electrostatic coalescence assisted filtration of solid and liquid contaminants from refined hydrocarbon fuels and non-water-soluble hydrocarbons such as those containing surface active additives. The contaminants are removed by including a first charged emitting screen electrode in the fluid flow with a conductive fibrous collecting bed downstream therefrom. The metallic coated fibers function substantially as a collecting electrode in the form of capillaries to attract very small particles of contaminants and cause them to collide with others to produce larger units, such as drops, thus increasing coalescence. The heavier, coalesced drops of water contaminants are drained off leaving the fuel substantially free of this contaminant. Solid contaminants are trapped and retained in a fibrous filter bed immediately upstream from the conductive fiber coalescing bed.

3,567,620

APPARATUS AND PROCESSES FOR THE MANUFACTURE OF OZONE

Rex Peter Ingram, Camberley, England, assignor to O-Three Instruments Limited, Weybridge, Surrey, England

Filed May 6, 1968, Ser. No. 726,731
Claims priority, application Great Britain, May 12, 1967, 22,084/67
Int. Cl. C01b *13/12*
U.S. Cl. 204—313 **8 Claims**



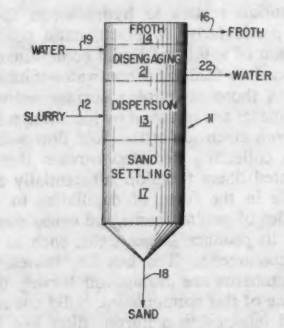
The specification discloses a compact apparatus for freshening air by the manufacture of ozone comprising

a plane metallic electrode, an insulating film covering one surface of that electrode, and a perforated metallic sheet, for example a sheet of metallic gauze or a perforated anodised aluminium sheet, in contact with the side of the insulating film remote from the metallic electrode. An electric potential is applied between the metallic electrode and the perforated metallic sheet sufficient for producing ozone in the interstices of the perforated metallic sheet, and the interstices of the perforated metallic sheet are directly accessible to the air or atmosphere to be freshened so that the ozone which is produced is able to disperse immediately into the air.

3,567,621
RECOVERY OF BITUMEN FROM BITUMINOUS SAND

George Ronald Gray and Lubomyr M. O. Cymbalisty, Edmonton, Alberta, Canada, assignors to Cities Service Athabasca, Inc.; Imperial Oil Limited; Atlantic Richfield Corporation; and Royalite Oil Company Limited, fractional part interest to each

Filed June 17, 1968, Ser. No. 737,655
Int. Cl. C10g *1/04*
U.S. Cl. 208—11 **4 Claims**



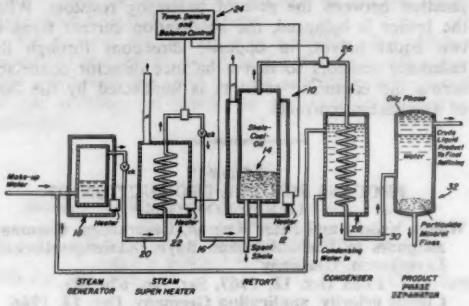
A process for the recovery of bitumen from tar sand in which a fluid slurry of tar sand is introduced into a body of hot water with bitumen rising to the top in the form of a layer of bituminous emulsion and sand settling to the bottom. Water is introduced immediately below the layer of bituminous emulsion to displace solids, froth particles associated with coarse solids, and prevent entrainment of fines in the emulsion. The additional water is preferably introduced into a quiescent zone in which a very slow downward velocity of water is maintained and water may be withdrawn from the lower portion of the quiescent zone to maintain a suitable downward velocity of water within the quiescent zone.

3,567,622
OIL RECOVERY PROCESS

Owen R. Waltrip, Roseville, Calif., assignor to Coleman D. Stephens, Jr., Sacramento, Calif.; John Konsonlas and Owen R. Waltrip, both of Roseville, Calif.; and Noel E. Adams, Oklahoma City, Okla., fractional part interest to each

Filed Nov. 21, 1968, Ser. No. 777,613
Int. Cl. C10g *1/02*
U.S. Cl. 208—11 **8 Claims**

A noncombustive, atmospheric pressure, retorting process for the production of high grade crude petroleum and petrochemicals from carbonaceous solids wherein superheated steam comprises a system carrier fluid and hydrogen donor and the retorting is carried out in the presence of a minor proportion of a middle fraction hydrocarbon oil selectively commingled with the carbonaceous solid



in the retort zone or injected into the retort zone with the carrier fluid.

3,567,623
ANTIFOULANT AGENTS FOR PETROLEUM HYDROCARBONS

Dennis J. Hagney, Doylestown, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

No Drawing. Filed Feb. 10, 1969, Ser. No. 805,930
Int. Cl. C10g *9/12, 9/16;* C23f *14/00*
U.S. Cl. 208—48 **15 Claims**

The present invention concerns a method for reducing or eliminating fouling deposits which are encountered in the processing or purification of crude hydrocarbons, hydrocarbon streams, petrochemicals, etc., and in particular to methods for preventing the deposition of fouling deposits wherein elevated temperatures are used. This objective is achieved by the addition of an antifouling amount of the product obtained by reacting an alkylene polyamine-aliphatic carboxylic acid reaction product with a lower aldehyde to the material being processed.

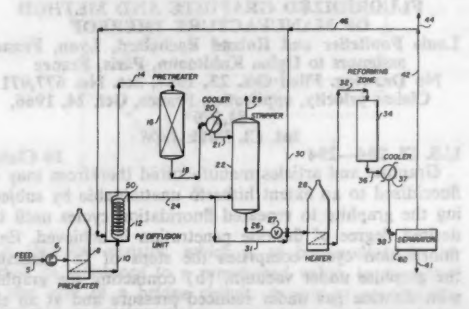
ERRATUM

For Class 208—89 see:
Patent No. 3,567,602

3,567,624
HYDROFORMING WITH PRELIMINARY HYDRODESULFURIZATION

William C. Pfefferle, Middletown, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Newark, N.J.

Filed July 17, 1968, Ser. No. 745,603
Int. Cl. C10g *23/00*
U.S. Cl. 208—89 **5 Claims**



A combination process for the desulfurization and catalytic hydroforming of normally liquid hydrocarbons

wherein the hydrogen required for desulfurization is obtained from the hydroformer reaction product and introduced into the feed to the desulfurizer by diffusion through a non-porous hydrogen permeable membrane.

3,567,625

HYDROFORMING WITH PROMOTED IRIDIUM CATALYST

John H. Sinfelt, Berkeley Heights, and Allan E. Barnett, Westfield, N.J., assignors to Esso Research and Engineering Company

No Drawing. Filed Feb. 6, 1969, Ser. No. 797,234
Int. Cl. C10g *35/06, 35/08*
U.S. Cl. 208—138 12 Claims

The use, in a hydroforming process, of a catalyst comprising iridium and a metal selected from the group consisting of gold, copper or silver, supported on a high surface area support results in the production of an improved hydroformate.

3,567,626

PROCESS FOR REDUCING THE SATURATE CONTENT OF AN OIL

Paul P. Bozeman, Jr., Groves, and Billy H. Cummins, Nederland, Tex., assignors to Texaco Inc., New York, N.Y.

No Drawing. Filed Dec. 18, 1968, Ser. No. 784,931
Int. Cl. C10g *21/02*
U.S. Cl. 208—316 3 Claims

A process for preparing aromatic oils with low saturate content, particularly rubber processing oils, by contacting a distillate extract with a hydrocarbon material containing up to 30 volume percent saturates and recovering an aromatic oil of reduced saturate content. The preferred solvent is furfural.

3,567,627

LUBE EXTRACTION WITH AN ETHYL GLYCOLATE SOLVENT

John M. McDonald, 152 Norman St., and Charles C. Hong, 811 Devine St., Apt. 30, both of Sarnia, Ontario, Canada

No Drawing. Filed Nov. 14, 1968, Ser. No. 775,942
Int. Cl. C10g *21/16*
U.S. Cl. 208—329 2 Claims

Polar materials, such as high molecular weight aromatics, are separated from petroleum distillate fractions by contacting a petroleum distillate fraction with a selective extraction solvent. The solvents employed, in accordance with this disclosure, are hydroxy substituted ethers and esters. The results obtained with these solvents are compared with the results obtained with the use of phenol.

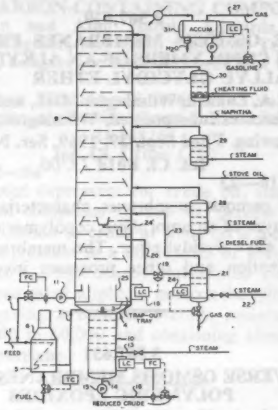
3,567,628

PRODUCTION OF HIGH FLASH POINT TOPPED CRUDE AND HIGH FLASH POINT ASPHALT

Joe Van Pool, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Oct. 25, 1968, Ser. No. 770,575
Int. Cl. B01d *3/32, 3/42;* C10g *7/00*
U.S. Cl. 208—355 4 Claims

A high flash point reduced crude oil and a high flash point specification asphalt are produced by first distilling a crude oil in a distillation operation practiced in a distillation zone having a fractionation section and a stripping section in which a lower portion of the fractionation section is maintained at the highest temperature in the overall operation and to which is passed crude oil heated to substantially said highest temperature. A portion of distillate taken from said lower portion of said fractionation section is admixed with the crude oil and heated together therewith and therefore, reintroduced into the operation. The heated crude oil is, in any event, introduced intermediate the fractionation section and the stripping section. Alternately, distillate in the lower portion of the fractionation section can be heated therein to the desired highest temperature or substantially highest temperature in the overall operation. There is avoided the passing of distillate produced in or reintroduced into the operation to the stripping section by removing gas oil from a point above said lower portion of said fractionation section responsive to liquid level in said lower portion of said fractionation section. A trap-out tray from which the distillate is removed and passed to the furnace is operated so as to prevent overflow of distillate therefrom into the stripping section. A level controller on the trap-out tray regulates the rate of removal of gas oil from the fractionation section so as to insure production of desired reflux in the lower portion of the fractionation section. A high flash point reduced crude is withdrawn from the lower portion or bottom of the stripping section. Fractions boiling lower than the gas oil are taken off from the upper portions of the fractionation section. The reduced crude oil is solvent extracted as by a propane extraction operation to produce specification high flash point asphalt.

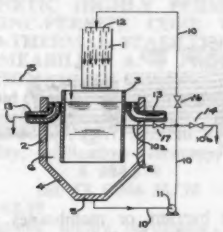


3,567,629

PROCESS AND PLANT FOR TREATING SEWAGE

Karl Cring Ayers and David Warren McAnaney, Chillicothe, Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed June 9, 1969, Ser. No. 831,586
Int. Cl. C02c *1/04*
U.S. Cl. 210—5 9 Claims



A process for the treatment of liquid containing biodegradable organic solids, as for example, sewage, and the

like, which, in general, combines desirable features of trickling filter and activated sludge systems and includes apparatus suitable therefor. A liquid containing biodegradable solids, as for example, sewage and the like is constantly recirculated from a sump or aerobic lagoon through a trickling filter, and effluent from the trickling filter is mixed with incoming raw sewage with agitation in the sump. The mixture is then retained in quiescent zones before overflow effluent is removed from the sump thus efficiently treating both settleable solids and dissolved solids contained in the sewage and the like.

3,567,630

REVERSE OSMOSIS MEMBRANES FROM AMORPHOUS COPOLYMERS OF AN ALKYLENE OXIDE AND ALLYL GLYCIDYL ETHER

Carl A. Lukach, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

No Drawing. Filed Sept. 29, 1969, Ser. No. 862,073

Int. Cl. B01d *13/00*

U.S. Cl. 210—23 **16 Claims**

Reverse osmosis membranes characterized by a salt-rejecting layer of an amorphous copolymer of an alkylene oxide and allyl glycidyl ether. The membranes are useful for desalination and other processes involving reverse osmosis.

3,567,631

REVERSE OSMOSIS MEMBRANES FROM POLYMERIC EPOXIDES

Carl L. Lukach, Harold M. Spurlin, Edwin J. Vandenberg, and William L. Young III, Wilmington, Del., assignors to Hercules Incorporated, Wilmington, Del.

No Drawing. Filed July 22, 1969, Ser. No. 843,752

Int. Cl. B01d *13/00*

U.S. Cl. 210—23 **23 Claims**

Reverse osmosis membranes characterized by a salt-rejecting layer of an amorphous polymer derived from epihalohydrin and an alkylene oxide. The membranes are useful for desalination and other processes involving reverse osmosis.

3,567,632

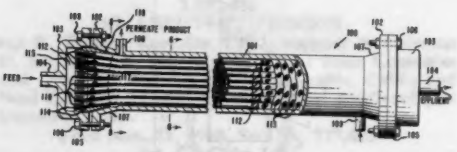
PERMSELECTIVE, AROMATIC, NITROGEN-CONTAINING POLYMERIC MEMBRANES

John William Richter, Kennett Square, and Harvey Herbert Hoehn, Hockessin, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of application Ser. No. 757,272, Sept. 4, 1968. This application Aug. 8, 1969, Ser. No. 848,611

Int. Cl. B01d *13/00*

U.S. Cl. 210—23 **40 Claims**



Permselective barriers or membranes prepared from synthetic, organic, nitrogen-linked aromatic polymers of the formula —LR— where L is a selected nitrogen-containing functional linkage such as an amide linkage, and R is a selected aromatic-containing linkage such as phenylene. The membranes are useful in separating components of fluid mixtures or solutions such as water containing dissolved salts

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3,567,633

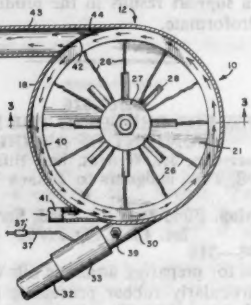
METHOD OF TREATING WASTE MATTER

Joe M. Valdespino, Orlando, Fla., assignor to Tekmar Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 866,810, Oct. 16, 1969. This application Mar. 30, 1970, Ser. No. 23,661

Int. Cl. B01d *21/26*

U.S. Cl. 210—62 **7 Claims**



The method of treating solid and liquid waste matter including the steps of separating liquid matter from solid matter, comminuting the solid waste matter within a chamber and introducing a stream of burning fuel under pressure into the chamber to incinerate the comminuted material, as well as including the steps of introducing liquid waste matter into an auxiliary tank and treating said liquid matter with a neutralizing agent prior to discharge.

3,567,634

CORROSION INHIBITOR DETERIORATION REDUCER

William E. Billings, London, England, and David Morris, Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

No Drawing. Continuation-in-part of application Ser. No. 366,607, May 11, 1964, which is a continuation-in-part of application Ser. No. 133,294, Aug. 23, 1961. This application July 24, 1967, Ser. No. 655,282

Int. Cl. C23f *11/04;* **E21b** *43/28*

U.S. Cl. 252—8.55 **4 Claims**

This patent describes a non-corrosive fluid composition for treating earthen formations containing sulfides, consisting essentially of an aqueous solution of hydrochloric acid, a corrosion inhibiting amount of a hydrochloric acid inhibiting agent subject to deterioration by sulfides, said sulfides being present in a sufficient amount to reduce the effectiveness of said inhibiting agent, and a corrosion inhibitor deterioration reducing agent having the formula of

$$R-\overset{O}{\overset{\|}{S}}-R$$

wherein R is selected from the group consisting of alkyl group and aryl group, each group having from 2 to 10 carbon atoms and said corrosion inhibitor deterioration

reducing agent being present in a sufficient amount to reduce the deterioration effect of said sulfides on said inhibiting agent.

3,567,635

LUBRICANT AND ANTISTATIC COMPOSITION

Kenneth D. Ballou, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

No Drawing. Continuation of application Ser. No. 471,752, July 13, 1965. This application June 5, 1969, Ser. No. 833,876

Int. Cl. D06m *13/38, 13/46*

U.S. Cl. 252—8.8 1 Claim

There is provided a composition for treating textile fibers whereby antistatic and lubricating properties are imparted to the fibers. The composition comprises:

(a) a cationic quaternary ammonium compound such as stearamido-propyl dimethyl β-hydroxyethyl ammonium nitrate,

(b) a nonionic ethylene oxide adduct of mixed fatty amines,

(c) a lower alkyl fatty ester, and

(d) an ethylene oxide adduct of alkyl phenol. There is also provided a process for treating textile fibers with the above composition.

3,567,636

ESTER-BASED LUBRICATING OILS CONTAINING POLYALKYLENEOXIDE-PHOSPHATE ESTERS

William Katzenstein, Broomall, Pa., assignor to GAF Corporation, New York, N.Y.

No Drawing. Continuation of application Ser. No. 596,402, Nov. 23, 1966, which is a continuation-in-part of application Ser. No. 334,917, Dec. 31, 1963. This application June 6, 1969, Ser. No. 834,591

Int. Cl. C10m *1/46*

U.S. Cl. 252—32.5 10 Claims

A lubricating composition comprising a major proportion of an ester-based lubricating fluid and a minor amount of a phosphate ester or salt thereof of a nonionic surface active compound, said phosphate ester being selected from the group consisting of mono-esters, di-esters and mixtures thereof, said nonionic surface active compound being the condensation produce of an organic hydroxy compound of from 8 to 50 carbon atoms selected from the group consisting of alkyl phenols and alkanols with at least 1 mole of an alkylene oxide having from 2 to 3 carbon atoms, the nonionic surface active compound containing a maximum of about 50 percent by weight of alkylene oxide based on the weight of the nonionic surface active compound.

3,567,637

METHOD OF PREPARING OVER-BASED ALKALINE EARTH LONG-CHAIN ALKENYL SUCCINATES

Albert R. Sabol, Munster, Ind., assignor to Standard Oil Company, Chicago, Ill.

No Drawing. Filed Apr. 2, 1969, Ser. No. 812,842

Int. Cl. C10m *1/10*

U.S. Cl. 252—39 6 Claims

Over-based alkaline earth salts of long chain alkenyl-substituted succinic anhydride or acid (hereinafter referred to as alkaline earth long chain alkenyl succinates) are prepared by reacting a long chain alkenyl-substituted succinic anhydride or acid, having at least 30 carbon atoms in the alkenyl substituent, or the alkaline earth salt thereof, with more than stoichiometric amounts of an inorganic basic alkaline earth compound in the presence of a lower alkanol, sufficient amounts of gaseous carbon dioxide to convert the excess basic alkaline earth compound to carbonate, and catalytic amounts of ammonia.

3,567,638

NOVEL PHOSPHORUS-CONTAINING ADDUCTS IN OIL COMPOSITIONS CONTAINING THE SAME

Milton Braid, Westmont, N.J., assignor to Mobil Oil Corporation

No Drawing. Filed Sept. 26, 1968, Ser. No. 762,967

Int. Cl. C10m *1/48*

U.S. Cl. 252—46.7 12 Claims

The reaction between diorganophosphinodithioic acids and vinyl carboxylates produces novel adducts having improved high temperature stability while imparting oxidation inhibition to organic base media.

3,567,639

HYDROCARBON-CONTAINING COMPOSITIONS

Colin Aaron and Alan Harold Edwards, Charlton, Wantage, England, and Keith Campbell Tessier, Westfield, N.J., assignors to Esso Research and Engineering Company

No Drawing. Filed May 8, 1967, Ser. No. 636,597

Claims priority, application Great Britain, June 1, 1966, 24,368/66

Int. Cl. C10m *1/28*

U.S. Cl. 252—56 7 Claims

A pour point depressant for crude oil, shale oil or a fuel oil which comprises 35–100 wt. percent of residua from the distillation of crude or shale oil is disclosed. The pour point depressant is a copolymer of ethylene and a vinyl or C_1 to C_{30} hydrocarbyl substituted vinyl ester of a C_1 to C_{30} saturated aliphatic monocarboxylic acid, said copolymer having a number average molecular weight of about 4,000 to 60,000 and containing about 40 to 95 wt. percent ethylene.

3,567,640

QUENCH OIL COMPOSITION AND METHOD OF USE

James A. Stroh, Ferndale, Mich., assignor to Park Chemical Company, Detroit, Mich.

No Drawing. Continuation of abandoned application Ser. No. 701,112, Jan. 29, 1968. This application Mar. 25, 1970, Ser. No. 20,475

Int. Cl. C10m *1/00*

U.S. Cl. 252—59 12 Claims

An improved quenching oil composition comprised of a major portion of a petroleum oil having a viscosity within the range of about 40 to about 300 SUS (Saybolt Universal Seconds) at 100° F. and a flash point in excess of 250° F. and about 2% to about 15% by weight of a quench oil additive, which is an oil soluble petroleum resin produced from distillates of cracked petroleum stock having a melting point of at least 40° C. and an aniline point value of less than 50° C. (ASTM–D–6611–64). The composition disclosed herein has led to unexpectedly good quenching oil properties and in particular the disclosed quench oil composition has unexpectedly superior high temperature stability when used for prolonged periods in quench oil baths.

3,567,641

FERROMAGNETIC HIGHLY PERMEABLE MANGANESE-ZINC-FERRITE CORE WITH GREAT TIME-AND-THERMAL STABILITY OF THE INITIAL PERMEABILITY AND PROCESS FOR ITS FABRICATION

Erich Ross and Ingrid Hanke, Munich, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed July 3, 1967, Ser. No. 650,907

Claims priority, application Germany, July 1, 1966, S 104,579

Int. Cl. C04b *35/38*

U.S. Cl. 252—62.59 16 Claims

A ferromagnetic highly permeable manganese-zinc-ferrite with great time and thermal stability of the initial permeability, having more than about 49 mol percent iron oxide, an amount of TiO_2 and very small amounts of CaO,

characterized by the following composition with respect to the initial oxide:

	Mol percent
Fe_2O_3	49–51.6
TiO_2	.8–3
MnO	26–30.5
ZnO	17–22

and, in addition, CaO in the order of magnitude of 0.05–0.2% by weight, and the method of making the same comprising the steps of mixing the substantially pure initial oxides, pre-sintering the same, wet-grinding with the addition of $CaCO_3$ or CaO, pressing the same, sintering at 1100–1300° C. in a low oxygen atmosphere and cooling the same in a substantially pure nitrogen atmosphere.

3,567,642

HYDROTHERMAL PROCESS FOR GROWING CRYSTALS HAVING THE STRUCTURE OF BERYL IN AN ALKALINE HALIDE MEDIUM

Edith M. Flanigen, Buffalo, N.Y., assignor to Union Carbide Corporation

No Drawing. Continuation-in-part of application Ser. No. 629,817, Apr. 10, 1967, which is a continuation-in-part of abandoned application Ser. No. 345,605, Feb. 18, 1964. This application Mar. 25, 1968, Ser. No. 715,503

Int. Cl. B01i *17/00;* **C04b** *35/00*

U.S. Cl. 252—62.58 **12 Claims**

A hydrothermal process for growing relatively large macro-crystals having the structure of beryl. Growth takes place on seed crystals from an alkaline medium which includes alkali metal and/or ammonium halides.

3,567,643

HYDROTHERMAL PROCESS FOR GROWING CRYSTALS HAVING THE STRUCTURE OF BERYL IN AN ACID HALIDE MEDIUM

Edith M. Flanigen, Buffalo, and Norbert R. Mumbach, Eggertsville, N.Y., assignors to Union Carbide Corporation

No Drawing. Continuation-in-part of application Ser. No. 646,121, June 14, 1967, which is a continuation-in-part of application Ser. No. 345,562, Feb. 18, 1964. This application Mar. 25, 1968, Ser. No. 715,505

Int. Cl. B01j *17/00;* **C04b** *35/00*

U.S. Cl. 252—62.58 **9 Claims**

A hydrothermal process for growing relatively large macro-crystals having the structure of beryl. Growth takes place on seed crystals from an acid medium which includes alkali metal and/or ammonium halides.

3,567,644

HYDRAULIC FLUID CONTAINING 1,4,5,6,7,7-HEXACHLOROBICYCLO - [2.2.1] - HEPT - 5-ENE-2-YL-METHYL ALKANOATE BASE

Bruce W. Hotten, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Filed May 21, 1968, Ser. No. 730,954

Int. Cl. C09k *3/00*

U.S. Cl. 252—75 **15 Claims**

Flame-resistant hydraulic fluid and method of transmitting power employing fluid having as a base a chlorinated unsaturated ester which is a 1,4,5,6,7,7-hexachlorobicyclo-[2.2.1]-hept-5-ene-2-yl-methyl alkanoate.

3,567,645

SILICA DESICCANTS AND METHOD OF MANUFACTURE

Juergen Dultz, Hannover, Germany, assignor to Kali-Chemie Aktiengesellschaft, Hannover, Germany

No Drawing. Filed Nov. 23, 1965, Ser. No. 509,429

Claims priority, application Germany, Nov. 25, 1964, K 54,622

Int. Cl. C09k *3/00*

U.S. Cl. 252—194 **17 Claims**

A process for manufacturing silica gel desiccants having high resistance to water, high attrition resistance, and high drying capacity, which comprises making a hydrosol, forming a hydrogel therefrom, cooling and aging the hydrogel, washing and drying it, and calcinating the resulting silica gel at a temperature between about 300 to 450° C. The silica gel desiccants of high resistance to water, high desiccant and high attrition resistance.

3,567,646

STABLE CESIUM COMPOUNDS

John H. Gray III, Baltimore, Md., assignor to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed Apr. 22, 1964, Ser. No. 362,556

Int. Cl. C09k *3/00;* **C01g** *41/00*

U.S. Cl. 252—301.1 **8 Claims**

1. The method of making a stable cesium compound, comprising combining Ta_2O_5 and Cs_2WO_4 at between 1000° C. and 1400° C. until a constant weight is obtained to form cesium tungsten tantalate.

2. A composition for a high temperature radioactive heat source for radioisotope heated thermoelectric generators, which consists essentially of stoichiometric mixtures of Cs^{137} containing Cs_2WO_4 and a metal oxide selected from the group consisting of Ta_2O_5 and Nb_2O_5 mixed with 1–15% by weight B_2O_3 which acts as a flux that prevents the high temperature decomposition of the composition.

3,567,647

PHOSPHORESCENT CRYSTALS

Gerard Ernest Gerhardt, Warren Township, Somerset County, N.J., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Mar. 27, 1968, Ser. No. 716,300

Int. Cl. C09k *1/02;* **C09d** *5/22*

U.S. Cl. 252—301.2 **14 Claims**

A phosphorescent composition comprising mixed crystals of (a) a polynuclear condensed ring compound such as pyrene, a halopyrene, benz[a]anthracene, benzo[ghi] perylene, coronene and/or the corresponding deuterated compounds, and (b) anthraquinone, a halogenated anthraquinone and/or an alkyl anthraquinone. The mixed crystals contain at least 0.001 mole percent of component (a). The phosphorescent compositions can be incorporated in liquid vehicles such as lacquers, paints or printing inks, and can be applied to the surface of solid articles such as paper, wood, or metals to impart phosphorescence thereto.

3,567,648

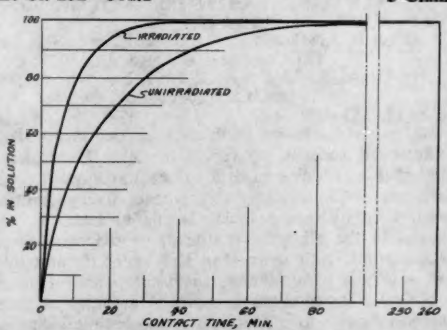
DISSOLUTION OF STAINLESS STEEL CLAD NUCLEAR FUEL ELEMENTS

William J. Walsh and R. Dean Pierce, Naperville, Ill., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed Apr. 8, 1969, Ser. No. 814,313

Int. Cl. G21c *19/42, 19/44, 19/50*

U.S. Cl. 252—301.1 **5 Claims**



The loss by entrainment of nuclear fuel particles in the dissolution of stainless steel cladding with molten zinc

can be prevented by mixing a molten salt with the molten zinc to getter any nuclear fuel fines present and enable an essentially complete recovery of nuclear fuel particles.

3,567,649

AQUEOUS EMULSION FOR PLATING PRETREATMENT OF MOLDED POLYOLEFINS

John J. Grunwald, New Haven, and Eugene D. D'Ottavio, Thomaston, Conn., assignors to MacDermid Incorporated, Waterbury, Conn.

No Drawing. Filed Mar. 28, 1968, Ser. No. 717,006

Int. Cl. B01g *13/00;* **B44d** *1/092*

U.S. Cl. 252—310 **6 Claims**

The invention discloses compositions for and methods of treating the surface of molded polyolefins, more especially polypropylene, polyethylene and polybutylene, prior to the deposition of a metallic plate thereon in order to improve the adherence of the plate to the surface of the polyolefin substrate. The compositions comprise stable, aqueous micro-emulsions of the oil-in-water type containing as the principal active agents a mixture of white phosphorus and trichloroethylene.

3,567,650

METHOD OF MAKING MICROSCOPIC CAPSULES

Joseph Anthony Bakan, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

No Drawing. Continuation of application Ser. No. 413,348, Nov. 23, 1964. This application Feb. 14, 1969, Ser. No. 802,730

Int. Cl. A61k *9/04;* **B01j** *13/02;* **B44d** *1/02*

U.S. Cl. 252—316 **2 Claims**

The process of forming minute capsules en masse which comprises (a) establishing an agitated system consisting of a liquid vehicle constituting a continuous first phase, a second phase dispersed therein consisting of minute mobile entities of core material, and a third phase dispersed therein consisting of minute, mobile liquid entities of a wall-forming solution of a polymeric material, the said core material being wettable by said wall-forming solution, the said three phases being mutually incompatible, the third phase constituting such a part of the total three-phase system, by volume, that it can exist as a dispersed phase of minute mobile entities capable of and sufficient in amount to deposit around the core entities, and wherein the wall-forming polymeric material has a decreasing solubility with increasing temperature in the vehicle, (b) hardening the walls so formed by elevating the temperature of the system to a temperature above the gel point of the wall-forming polymer, and (c) separating the hardened capsules from the rest of the system at a temperature above that at which resolution of the capsule walls takes place to any substantial degree.

3,567,651

DYE PENETRANT FOR SURFACES SUBSEQUENTLY CONTACTED BY LIQUID OXYGEN

Ralph M. F. Giles, La Mirada, and Isidore Pollack, Westminster, Calif., assignors to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

No Drawing. Filed Feb. 3, 1965, Ser. No. 430,192

Int. Cl. C09k *1/02;* **G01n** *21/16, 21/38*

U.S. Cl. 252—301.2 **1 Claim**

A dye penetrant inspection material and technique are described for nondestructive testing of solid surfaces that may be contacted by liquid oxygen. The dye penetrant solution comprises a trifluorochloroethylene polymer having a degree of polymerization in the range of from 2 to 10 in a quantity sufficient to suppress violent reaction of the solution with liquid oxygen, a halogenated solvent having an evaporation rate not greater than the evaporation rate of methylene chloride and miscible with said polymer, plus a dye soluble in said polymer and said solvent, the quantity of said dye being not greater than 1:20 relative to said polymer so that the solution is substantially insensitive to reaction to strongly oxidizing materials.

3,567,652

COPPER CHROMITE CATALYST FOR PREPARING 2,3-DIHYDRO-PARA-DIOXIN

Rodney D. Moss, Indianapolis, Ind., and Janet N. Paige, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Original application May 26, 1966, Ser. No. 553,061, now Patent No. 3,413,312, dated Nov. 26, 1968. Divided and this application May 17, 1968, Ser. No. 739,583

Int. Cl. B01j *11/82*

U.S. Cl. 252—440 **1 Claim**

The invention relates to a new and improved process for preparing 2,3-dihydro-para-dioxin. More particularly the present invention concerns the preparation of 2,3-dihydro-para-dioxin by the simultaneous dehydrogenation and dehydration of diethylene glycol in the liquid phase using a copper chromite catalyst promoted with an alkali metal acid sulfate or an alkali metal pyrosulfate.

3,567,653

COPOLYMER CATALYST SYSTEM AND PRODUCT

Joseph Wagensommer, 57 Barchester Way, Westfield, N.J. 07090; Richard J. Lauria, 16 Ely Place, Edison, N.J. 08817; and John H. Stalb, 1224 Radcliff Place, Plainfield, N.J. 07062

No Drawing. Continuation of application Ser. No. 613,727, Feb. 3, 1967, which is a continuation-in-part of application Ser. No. 504,120, Oct. 23, 1965, which in turn is a continuation-in-part of application Ser. No. 464,862, June 17, 1965. This application July 16, 1969, Ser. No. 850,301

Int. Cl. C08f *15/04*

U.S. Cl. 252—429 **16 Claims**

A catalyst useful for copolymerizing ethylene and a higher alpha olefin is composed of an alkyl aluminum and the reaction product of, a vanadium compound (such as $VOCl_3$) and an alkyl titanate. Resulting copolymers may have a very high green strength as well as other desirable properties.

3,567,654

PROCESS AND CATALYST FOR HYDROCRACKING HYDROCARBON OIL

Ross E. Van Dyke, Orinda, Calif., assignor to Shell Oil Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 393,735, Sept. 1, 1964, which is a continuation-in-part of application Ser. No. 184,947, Apr. 4, 1962. This application July 29, 1965, Ser. No. 475,870

Int. Cl. B01j *11/24*

U.S. Cl. 252—459 **3 Claims**

A catalyst for hyddocracking hydrocarbon oils comprises an iron group metal and fluorine incorported into an amorphous acid-acting refractory oxide, the incorporation being carried out by contacting a hydrogel of said refractory oxide with an aqueous solution of an iron group metal compound, washing the contacted hydrogel and calcining at a temperature of about 800 to 1200° F.

3,567,655

METHOD OF PRODUCING A LOW-TEMPERATURE CATALYST FOR THE CONVERSION OF CARBON MONOXIDE WITH STEAM

Dimiter S. Shishkov, Diko G. Ivanov, Ivan P. Dombalov, Ganka I. Radoeva, and Radka G. Mishtalova, Sofia, Bulgaria, assignors to Himicheski Kombinat, Vratza, Bulgaria

No Drawing. Filed July 25, 1968, Ser. No. 747,449
Claims priority, application Bulgaria, Aug. 1, 1967, I–1,115
Int. Cl. B01j 11/06, 11/32
U.S. Cl. 252—468 2 Claims

A catalyst for the gas-phase reaction of carbon monoxide and steam to yield hydrogen having the general formula, in terms of weight proportion, of $[CuO]_3 \cdot [Cr_2O_3] \cdot [ZnO]$, and formed by precipitating hydrated copper nitrate and zinc nitrate solutions containing CrO_3 or Cr_2O_3 with ammonia. The precipitate is dried, granulated and made into tablets such that the catalyst composition consists essentially of about 31.3% by weight copper oxide, 30.5% by weight zinc oxide and 38.2% by weight Cr_2O_3 or 49.7% by weight copper oxide, 17.8% by weight zinc oxide and 32.5% by weight CrO_3.

3,567,656

PREPARATION OF A CATALYTIC COMPOSITE CONTAINING A GERMANIUM COMPONENT

Roy T. Mitsche, Island Lake, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed May 28, 1969, Ser. No. 828,716
Int. Cl. B01j 11/08, 11/22
U.S. Cl. 252—466 11 Claims

A germanium component is uniformly dispersed throughout a porous, high surface area carrier material by the steps of: first, reducing germanium dioxide with hydrogen; second, dissolving the resulting reduced material in an aqueous solution of chlorine to form a solution thereof; third, impregnating a high surface area, porous carrier material with the resulting solution; and, finally, drying and calcining the resulting impregnated carrier material. Key feature of this method of preparation involves the use of this solution of the reduced germanium compound in chlorine water to impregnate the carrier material, thereby achieving uniform dispersion of the germanium component in the carrier material.

3,567,657

ELECTRICALLY CONDUCTIVE SKIN CONDITIONING SYSTEM

Joseph Lichtenstein, Colonia, N.J. 07067

No Drawing. Filed May 29, 1968, Ser. No. 732,867
Int. Cl. A01n 9/00; H01b 1/00
U.S. Cl. 252—500 5 Claims

The use of an electrically conductive material selected from the group consisting of benzoic, salicyclic, tartaric, citric, lactic and malic acids, the sodium and potassium salts thereof, the sodium and potassium acid salts thereof and mixtures of the same, with electrical medical instrumentation such as electro-cardiographic diagnostic equipment.

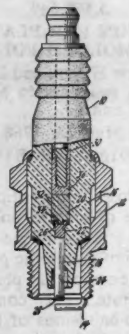
3,567,658

RESISTOR COMPOSITION

Richard A. Webb, Davison, Karl Schwartzwalder, Holly, and Patrick N. Kesten, Davison, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 21, 1967, Ser. No. 692,528
Int. Cl. H01b 1/06; H01t 13/20
U.S. Cl. 252—506 6 Claims

An improved resistor composition for use in resistor spark plugs and other electrical devices is disclosed. The resistor composition contains a compound taken from the group consisting of lithium carbonate, zinc carbonate, magnesium carbonate and sodium carbonate and a metal powder taken from the group consisting of zinc, antimony and tellurium in addition to the conventional resistor composition ingredients. The carbonate, for example, lithium



carbonate, and the metal, for example, zinc, combine to yield a strong resistor mass having a low porosity which bonds tightly to the center electrode head in the spark plug insulator centerbore.

3,567,659

WATER-SOLUBLE CATIONIC POLYMERS FROM EPICHLOROHYDRIN AND METHYLAMINE

Daniel Elmer Nagy, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Nov. 26, 1968, Ser. No. 778,934
Int. Cl. C08g 33/06
U.S. Cl. 260—2 6 Claims

A cationic, water-soluble, storage-stable, methylamine-epichlorohydrin polymer is prepared by reacting a quantity of a methylamine-epichlorohydrin polymer which is well below its gel point with successively added small amounts of epichlorohydrin until the polymer nears the stage at which it is an irreversible gel, and then reacting the polymer with sufficient methylamine to inactivate substantially all amine-reactive epichlorohydrin residues present. At least the last step of the reaction is performed at a temperature at which a partial depolymerization of the polymer occurs.

Water-soluble polymers of higher molecular weight and larger dimensions are produced by graft polymerizing one or more water-soluble vinyl monomers upon a hydrophilic water-dispersible cationic poly(hydroxyalkylene) polyamine, which is not necessarily the foregoing polyamine. The polymers are flocculants for suspended solids in sewage and mine effluent water and dry strength agents for paper.

3,567,660

METHOD OF CONVERSION OF OIL-SPILLS INTO IMPROVED, RUBBERIZED CARBON-BLACK AND FIBER FORTIFIED ASPHALTIC MATERIALS

Joseph Winkler, 120 Wilson Drive, Hazleton, Pa. 18201

No Drawing. Filed Feb. 2, 1970, Ser. No. 7,997
Int. Cl. E02b 15/04
U.S. Cl. 260—2.3 9 Claims

A new method of conversion of oil spills into improved rubberized, fiber fortified asphaltic materials by coagulating oil spills with previously ground, spent automotive rubber tires which have preferably been previously premixed with powdery polystyrene or asphalt, said asphalt derived from naturally occurring asphaltite from petroleum or coal tars; harvesting by mechanical means the resulting non-liquid conglomerate reacting and concentrating this mixture by distillation to an asphaltic consistency.

3,567,661

POLYURETHANE PRODUCTS PREPARED FROM OXYALKYLENE CONDENSATES OF CELLULOSE AND METHOD OF PRODUCING SAME

John T. Patton, Jr., Wyandotte, Mich., and Henry E. Reich, Wilmette, Ill., assignors to Wyandotte Chemicals Corporation, Wyandotte, Mich.

No Drawing. Original application Oct. 7, 1963, Ser. No. 314,480, now Patent No. 3,336,291, dated Aug. 15, 1967. Divided and this application June 15, 1967, Ser. No. 662,222

Int. Cl. C08g *22/14, 22/44*

U.S. Cl. 260—2.5 2 Claims

A polyurethane product and method of producing same by coreacting a mixture of an organic polyisocyanate and polyoxyalkylene condensate of cellulose. The polyoxyalkylene condensate of cellulose in turn comprises the reaction product of at least one alkylene oxide with cellulosic material in the presence of a high molecular weight polyoxyalkylene alcohol derivative.

3,567,662

LOW TEMPERATURE METHOD FOR PREPARING FOAM PRODUCT

Charles R. Schmitt, Oak Ridge, Tenn., assignor to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed Oct. 18, 1967, Ser. No. 677,002

Int. Cl. C08g *22/46*

U.S. Cl. 260—2.5 3 Claims

Furfuryl alcohol is polymerized at temperatures ranging from −80° C. to +80° C. employing a reaction mixture of furfuryl alcohol and a solvent selected from the group consisting of methanol, ethanol, toluene, and secondary butyl alcohol which is rapidly mixed with a Friedel-Crafts type catalyst selected from the group consisting of chlorosulfonic acid, phosphorous trichloride, thionyl chloride, phosphorous pentoxide, fluosulfonic acid and difluophosphoric acid. Also, a foamed product is prepared by adding a surfactant to the reaction mixture prior to reacting same with the Friedel-Crafts type catalyst.

3,567,663

LOW PERMEABILITY POLYURETHANE FOAM AND PROCESS FOR THE MANUFACTURE THEREOF

Rocco P. Triolo, Broomall, and Roland J. Lamplugh, Linwood, Pa., assignors to Scott Paper Company, Delaware County, Pa.

No Drawing. Filed Jan. 5, 1968, Ser. No. 695,871

Int. Cl. C08g *22/44*

U.S. Cl. 260—2.5 15 Claims

Low permeability polyurethane foam comprising a polyether-type polyurethane having incorporated therein a polybutene and unsaturated fatty acid or mixture of unsaturated fatty acids, and a process for making a low permeability polyether-type polyurethane foam by reacting a polyisocyanate and a polyether polyol in the presence of a polybutene and an unsaturated fatty acid or mixture of unsaturated fatty acids.

3,567,664

POLYURETHANE FOAMS STABILIZED AGAINST SCORCH WITH A MIXTURE OF BUTYLATED HYDROXY TOLUENE AND p,p'-DIOCTYL DIPHENYL AMINE

Robert C. Haring, Woodbridge, Conn., assignor to Olin Corporation

No Drawing. Continuation-in-part of application Ser. No. 540,806, Apr. 7, 1966. This application Oct. 15, 1968, Ser. No. 767,808

Int. Cl. C08g *22/46, 22/00*

U.S. Cl. 260—2.5 12 Claims

Polyurethane foams are stabilized against scorching when a mixture of 2,6-ditertiary-butyl-4-methyl phenol and a p,p'-dialkyl diphenyl amine containing between about 3 and about 18 carbon atoms in the alkyl, is present in a foam forming reaction mixture of an organic diisocyanate, the reaction product of a 1,2-oxide and an aliphatic polyhydric alcohol contains between 2 and 6 hydroxyl groups and 2 and 8 carbon atoms per molecule, a reaction catalyst and a foaming agent. The proportion of the amine in the stabilizing mixture is between about 15 and 90 percent by weight.

3,567,665

POLYURETHANE RESINS CONTAINING BROMINATED POLYOL ETHERS

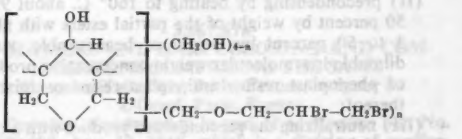
Sammy Carpenter, Bolckow, Mo., Enrique R. Witt, Corpus Christi, Tex., and Joseph J. Cahill, Jr., Colonia, N.J., assignors to Celanese Corporation

Original application Mar. 12, 1965, Ser. No. 439,466, now Patent No. 3,385,900, dated May 28, 1968. Divided and this application Nov. 16, 1967, Ser. No. 699,754

Int. Cl. C08g *22/08, 22/44*

U.S. Cl. 260—2.5 5 Claims

A flame-retardant polyurethane resin is formed from a mixture comprising at least one organic polyisocyanate and at least one brominated polyol ether which can be a 2,3-dibromopropyl ether of sorbitol or a 2,3-dibromopropyl ether having the general formula:



wherein *n* represents an integer from 1 to 4.

3,567,666

SEPARATION MEANS

Carl Berger, 13401 Kootenay, Santa Ana, Calif. 92705

No Drawing. Filed Feb. 2, 1968, Ser. No. 702,525

Int. Cl. C08f *47/10*; C08v *1/16*

U.S. Cl. 260—2.5 9 Claims

This invention relates to a novel composite product which is employed as a separation means in reverse osmosis, gas mixtures and galvanic devices. The efficient separation mode is a result of the channel structure of the polymer coupled with the uniform porosity of the particulate within the polyer.

3,567,667

MOULD LININGS COMPOSITION COMPRISING BALL MILL DUST AND CALCIUM SILICATE, ALUMINUM SILICATE OR CALCIUM ALUMINO SILICATE FIBROUS REFRACTORY MATERIAL

Bernard Carl Rumbold, Nechells, England, assignor to Foseco International Limited, Birmingham, England

No Drawing. Filed Feb. 23, 1968, Ser. No. 707,471

Claims priority, application, Great Britain, Mar. 22, 1967, 13,587/67

Int. Cl. B22c *1/22*; C08g *51/18*

U.S. Cl. 260—17.2 7 Claims

Hot topping and mould lining materials which contain a major proportion of ball mill dust and proportions of refractory fibrous materials selected from calcium silicate, aluminium silicate and calcium aluminosilicate having advantageous properties compared with prior art similar materials containing asbestos.

3,567,668

METHOD FOR PREPARING AND COMPOSITIONS OF EPOXY RESIN ESTERS PRECONDENSED WITH PHENOPLASTIC OR AMINOPLASTIC RESINS

Rolf Güldenpfennig, Dossenheim, Germany, assignor to Reichhold Chemie Aktiengesellschaft, Hamburg, Germany

No Drawing. Filed Feb. 13, 1968, Ser. No. 705,008
Claims priority, application Germany, Feb. 24, 1967, R 45,371
Int. Cl. C08g *45/08, 45/10*
U.S. Cl. 260—19 13 Claims

Water-dilutable, heat-curable coating compositions prepared by:

(I) forming partial esters of compounds containing epoxy groups or hydroxyl groups by hydrolytic dissociation of the epoxy groups with adducts of maleic acid with fatty acids or maleic anhydride with fatty acids, the fatty acids consisting of drying oil acids, semi-drying oil acids and mixtures of the oil acids with rosin acids, the fatty acids containing unsaturated monocarboxylic acids, the molar proportion of monocarboxylic acid to maleic acid or maleic anhydride being between about 0.9:1 and 1.1:1, the compounds containing epoxy groups consisting of epoxy resins having molecular weights of about 380 to 3500;

(II) precondensing by heating to 160° C. about 99 to 50 percent by weight of the partial esters with about 1 to 50 percent by weight of heat-curable, water-dilutable low molecular weight condensation products of phenoplast resins, aminoplast resins or mixtures thereof;

(III) neutralizing the precondensed product with a basic material; and

(IV) diluting the neutralized product with water;

in a particular embodiment the steps of the process are varied wherein the epoxy resins are first precondensed with the phenoplast or aminoplast resins and then the epoxy groups of the epoxy resins are reacted with the adducts of maleic acid and maleic anhydride.

3,567,669

PREPARATION OF RIGID POLYVINYL CHLORIDE PARTICLES HAVING A HIGH BULK DENSITY

Joseph M. Georgiana, Painesville, Anthony M. Mierzwa, North Madison, Robert A. Paradis, Willoughby, and James A. Rolls and Donald R. Voss, Painesville, Ohio, assignors to Diamond Shamrock Corporation

No Drawing. Filed Aug. 4, 1967, Ser. No. 658,337
Int. Cl. C08f *29/18, 29/24, 45/58*
U.S. Cl. 260—23.7 6 Claims

Employing resin produced by aqueous suspension polymerization, a rigid polyvinyl chloride resin powder composition has been prepared in mixing procedures wherein maximum temperatures attained range generally from 340° F. to 425° F. By reason of these elevated mixing temperatures, the composition has a higher bulk density than similar powder formulations prepared according to prior art methods. Most important, it exhibits fusion and processing characteristics significantly altered from those of the prior art formulations and may be processed at high rates in many different types of equipment. This densified, rigid polyvinyl chloride resin powder composition is useful for the preparation of high-quality plastic articles, e.g., pipe, fittings, rods, tubes, film, sheeting or containers, both by extrusion and molding technique.

3,567,670

COMPOSITIONS OF ABS COPOLYMERS CONTAINING MONOALKYL ETHERS OF TRIPROPYLENEGLYCOL

Floyd B. Nagle, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Dec. 29, 1967, Ser. No. 694,419
Int. Cl. C08c *11/28, 11/32*
U.S. Cl. 260—33.2 4 Claims

Compositions comprising ABS copolymers, i.e. acrylonitrile, styrene, butadiene rubber interpolymers, having intimately incorporated therewith from 0.5 to 2 percent by weight of a monoalkyl ether of tripropylene glycol having the general formula

$$HO—(C_3H_6O)_3—R$$

wherein R is an alkyl radical having from one to four carbon atoms.

3,567,671

TACK-FREE IMPREGNATED GLASS FIBER REINFORCEMENT FOR ELASTOMERIC MATERIALS

Nicholas S. Janetos, Providence, and Alfred Marzocchi, Cumberland, R.I., assignors to Owens-Corning Fiberglas Corporation

No Drawing. Filed Nov. 17, 1966, Ser. No. 595,036
Int. Cl. C08f *45/52*
U.S. Cl. 260—28.5 4 Claims

The invention is addressed to glass fibers treated to improve their combination with elastomeric materials in the manufacture of glass fiber reinforced elastomeric products in which glass fibers are coated or bundles of glass fibers are impregnated with a composition formulated of a resorcinol aldehyde resin, a butadiene-styrene-vinyl pyridine terpolymer and a latex of carboxylated butadiene-styrene, acrylic resin or vinyl chloridevinylidene chloride copolymer and an incompatible wax which operates to reduce the tackiness of the treated or impregnated glass fibers to enable the treated fibers to be processed to the form desired for use in the combination with the elastomeric material but without impairing the bonded relationship between the treating material and the glass fibers or between the glass fibers and the elastomeric material of the continuous phase.

3,567,672

COATING COMPOSITION AND PROCESS COMPRISING CALCIUM SULFOALUMINATE PIGMENT, A RUBBERY LATEX BINDER AND A COPOLYMER OF STYRENE AND MALEIC MONOMER

Donald Graham Hobbs, Sarnia, Ontario, Canada, assignor to Polymer Corporation Limited, Sarnia, Ontario, Canada

No Drawing. Filed Apr. 8, 1968, Ser. No. 719,758
Claims priority, application Canada, May 3, 1967, 989,481
Int. Cl. C08d *13/18;* C08f *41/12*
U.S. Cl. 260—29.6 10 Claims

One or more of the problems associated with the preparation of a water-based coating composition of a mixture of a calcium sulfoaluminate pigment, a first binder of water-solubilized protein and/or polysaccharides, and a second binder being a rubbery polymer latex, is overcome by a process in which the first binder material is eliminated. The improved process uses the second binder material as the sole binder and this is accomplished by further including in the mixture from 0.5 to 5% by weight (based on the weight of calcium sulfoaluminate) of a water-solubilized copolymer of a styrene monomer with a maleic monomer in the ratio of 1:3 to 3:1 and having an average molecular weight of 1000–20,000. The improvement is especially applicable to the paper coating process.

3,567,673
BIPHENYL MODIFIED POLYESTERIMIDE WIRE ENAMEL
Lionel J. Payette, Scotia, N.Y., assignor to General Electric Company
No Drawing. Filed Nov. 12, 1968, Ser. No. 775,194
Int. Cl. C08f 45/28
U.S. Cl. 260—33.6 5 Claims

Polyesterimide base coating solutions having biphenyl as an additive are characterized by improved wire coating capability.

3,567,674
PROCESS OF PREPARING POLYAZO POLYMERS BY CATALYTIC COUPLING OF POLYMERS WITH TERMINAL PRIMARY AROMATIC AMINO GROUPS
Eduard Radlmann, Wolfhardt Schmidt, and Gunther Nischk, Dormagen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed Dec. 4, 1968, Ser. No. 781,279
Claims priority, application Germany, Dec. 14, 1967, F 54,311
Int. Cl. C08g 22/34, 51/54
U.S. Cl. 260—32.6 8 Claims

High molecular weight elastomeric polyazo polymers are made by the catalytic oxidative coupling of a linear aliphatic polymer, e.g. polyester, polyether, polythioether, or polyacetal, containing primary aromatic amino groups as the terminal portions of the polymer, the coupling being accomplished in the presence of a catalyst system comprising a copper salt and a basic organic compound containing a tertiary nitrogen atom.

3,567,675
ELECTROSTATIC SPRAYING OF ALUMINUM PIGMENTED PAINT
John W. Merck, Tyrone, Pa., and Lester L. Spiller, Indianapolis, Ind., assignors to Ransburg Electro-Coating Corp., Indianapolis, Ind.
No Drawing. Continuation-in-part of application Ser. No. 453,508, May 5, 1965, which is a continuation-in-part of application Ser. No. 125,933, July 24, 1961. This application Aug. 30, 1966, Ser. No. 575,953
The portion of the term of the patent subsequent to Oct. 5, 1982, has been disclaimed
Int. Cl. C08f 41/28
U.S. Cl. 260—33.6 7 Claims

When aluminum flakes are treated with aqueous treating agents in order to provide them with an insulating coating to assist electrostatic atomization, the water left by the aqueous agent is troublesome as is known. The treated flakes are washed with water miscible polar organic solvent to remove the water and then with a hydrocarbon solvent to remove the polar solvent, and the flakes are then dispersed in a coating composition in order that electrostatic atomization may proceed with minimum danger of arcing.

3,567,676
CORROSION PREVENTIVE COATING CONSISTING OF BINDER, METAL PIGMENTS AND FLUORIDE ACTIVATORS
Howard R. Herrigel and John C. Sargent, Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.
No Drawing. Filed Mar. 15, 1968, Ser. No. 713,328
Int. Cl. C08g 1/02, 51/04
U.S. Cl. 260—37 3 Claims

A coating and method for reducing the susceptibility of metal alloys including titanium alloys, aluminum alloys, high strength and stainless steels to stress corrosion. The coating comprises three components: (1) a metallic pigment of either zinc or aluminum; (2) an activator which, in the case of an aluminum pigment, may be either an ionizable fluoride (sodium fluoride, calcium fluoride, lithium fluoride or magnesium fluoride) or an acid salt (potassium acid sulfate, sodium acid sulfate or sodium diacid phosphate); and in the case of either an aluminum or a zinc pigment, the activator is a metallic hydroxide (barium hydroxide, calcium hydroxide, cesium hydroxide, lithium hydroxide, magnesium hydroxide, potassium hydroxide, rubidium hydroxide, sodium hydroxide, or strontium hydroxide); and (3) a binder of chlorinated rubber, polystyrene, polyvinyl chloride, alkyd resins, phenolic resins, acrylic resins, or silicone resins.

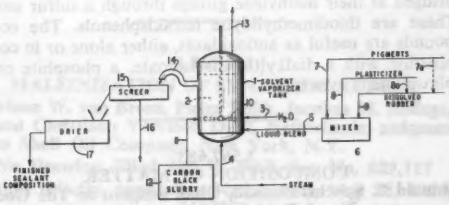
3,567,677
FLEXIBLE, REPAIRABLE, POTTABLE MATERIAL FOR ELECTRICAL CONNECTORS
James E. Webb, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Robert A. Dunaetz, Manhattan Beach, and Philip C. Crepeau, Buena Park, Calif.
No Drawing. Filed Apr. 16, 1968, Ser. No. 721,607
Int. Cl. C08g 23/14
U.S. Cl. 260—37 10 Claims

A flexible repairable, pottable composition of a matter suitable for encapsulating electrical connectors comprises diglycidyl ether of bisphenol A, diepoxide of polyglycol, and one or more amine curing agents. Optionally, the composition can contain one or more fillers in amounts which vary with the composition viscosity desired.

3,567,678
POLYMERS AND HAIR COLORING AND COMPOSITIONS COMPRISING THE SAME
Gregoire Kalopissis, Paris, France, assignor to L'Oreal, Paris, France
No Drawing. Continuation-in-part of application Ser. No. 459,498, Apr. 13, 1965, which is a division of application Ser. No. 227,542, Oct. 1, 1962. This application Apr. 10, 1967, Ser. No. 629,423
Claims priority, application France, Oct. 5, 1961, 875,144
Int. Cl. A61k 7/12; C08f 1/84
U.S. Cl. 260—41 10 Claims

Water soluble colored polymers which have dye groups attached to the polymer chain by amide bonds and solubilizing groups for coloring hair.

3,567,679
REMOVAL OF SOLVENTS FROM SEALANT COMPOSITIONS
Guy D. Nolan, Monroe, La., assignor to Cities Service Company
Filed Dec. 28, 1967, Ser. No. 700,315
Int. Cl. C08c 11/18
U.S. Cl. 260—41.5 10 Claims



Soft, nontacky, processable crumbs of sealant compound are formed by removal of an organic solvent from a liquid blend of sealant components by mixing the blend with hot water having carbon black dispersed therein. The carbon black of the aqueous dispersion is incorporated with the sealant composition.

3,567,680

SURFACE MODIFIED PIGMENTS AND METHODS FOR PRODUCING SAME AND ELASTOMERS CONTAINING SAME

Joseph Iannicelli, Macon, Ga., assignor to J. M. Huber Corporation, Locust, N.J.

No Drawing. Filed May 3, 1968, Ser. No. 726,585
Int. Cl. C08c *11/14;* C08h *17/02*
U.S. Cl. 260—41.5 5 Claims

A mercaptosilane grafted inorganic pigment such as kaolin clay for use as a reinforcing filler in elastomers, plastics, and the like is obtained by spray drying a dispersed aqueous slurry of the pigment in the presence of a small amount of mercaptoorganosilane. Small amounts of mercaptosilane grafted to inorganic pigments such as kaolin clay significantly increase the reinforcement of elastomers. A blend of mercaptosilane and aminosilane grafted to inorganic pigments such as kaolin clay gives higher reinforcement to elastomers than like amounts of either mercaptosilanes or aminosilanes grafted to the pigment alone.

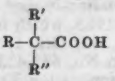
3,567,681

STABILIZER COMPOSITIONS FOR HALOGENATED RESINS, EMPLOYING THE METAL SALTS OF NEOACIDS

Lewis B. Weisfeld, Highland Park, and Carl W. Pause, Spotswood, N.J., assignors to Carlisle Chemical Works, Inc., Reading, Ohio

No Drawing. Filed Sept. 3, 1965, Ser. No. 485,094
Int. Cl. C08f *45/62*
U.S. Cl. 260—45.75 9 Claims

The light and heat stabilization of halogen-containing resins is further improved by metal soap components having the carboxylic acid moiety wholly or in part formed by a neo-acid of the following general formula:



wherein R, R' and R'' are alkyl groups having a total of 3–18 carbons and undesirable plating-out of pigments and similar additives is reduced.

3,567,682

ANTIOXIDANTS

Edward F. Zaweski, Pleasant Ridge, Mich., assignor to Ethyl Corporation, New York, N.Y.

No Drawing. Original application Oct. 11, 1967, Ser. No. 674,646. Divided and this application Nov. 24, 1969, Ser. No. 879,597
Int. Cl. C08f *45/58*
U.S. Cl. 260—45.85 9 Claims

Reaction of hydrogen sulfide with the hemi-quinone of a methylene bisphenol results in a tetranuclear phenol in which two molecules of the methylene bisphenol are bridged at their methylene groups through a sulfur atom. These are thiodimethylidyne tetrakisphenols. The compounds are useful as antioxidants, either alone or in combination with a dialkylthiodialkanoate, a phosphite or a phosphonate synergist.

3,567,683

COMPOSITION OF MATTER

Ronald B. Spacht, Hudson, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Continuation-in-part of application Ser. No. 381,525, July 9, 1964. This application Sept. 9, 1968, Ser. No. 758,583
Int. Cl. C08f *45/58*
U.S. Cl. 260—45.95 6 Claims

This invention relates to new hindered phenolic phosphite ester compounds and their use as stabilizers in rubber compositions.

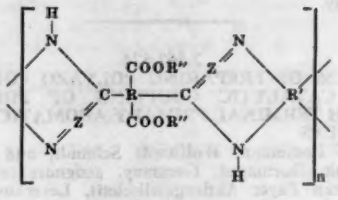
3,567,684

AMINO-POLYAMIDE ESTER ADHESIVE BINDERS

Gerfried Pruckmayr, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed July 26, 1966, Ser. No. 567,863
Int. Cl. C08g *20/00, 29/32*
U.S. Cl. 260—47 6 Claims

Amino-polyamide esters consisting essentially of recurring units of the formula



where R is a tetravalent carbocyclic aromatic radical, R' is a tetravalent aromtic or cycloliphatic radical, R'' is a monovalent aliphatic, cycloaliphatic, or aromatic radical and =Z= represents a structure selected from the group consisting of

(1) that in which H_2 is bonded to the N, as in the $—NH_2$ group, and O is bonded to the C, as in the $>C=O$ group, and

(2) that in which the $—NH_2$ group from (1) above is condensed with the $>C=O$ group from (1) above to leave a double bond joining N and C, as in the

$$—N=C—$$

group, with the proviso that less than all $—NH_2$ groups have condensed with $>C=O$ groups,

and *n* is an integer, said polymers having melting points between 50° C. and 250° C., and inherent viscosities in solution at 0.5 weight percent concentration and 30° C. of less than 0.2 are useful as high temperature adhesive binders.

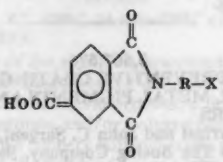
3,567,685

POLYMER OF A DIHYDRIC PHENOL AND AN IMIDE

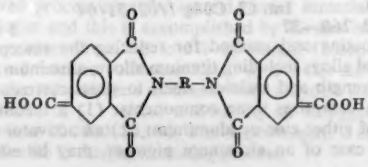
Charles A. Bialous, Mount Vernon, Ind., and Milton L. Evans, Schenectady, N.Y., assignors to General Electric Company

No Drawing. Continuation-in-part of application Ser. No. 603,463, Dec. 21, 1966. This application Aug. 26, 1969, Ser. No. 853,202
Int. Cl. C08g *17/13*
U.S. Cl. 260—47 5 Claims

A composition consisting of the reaction product of a dihydric phenol, a particular imide and a carbonyl halide wherein the particular imide is either



or



or mixtures thereof. In the formulas, R is divalent hydrocarbon radical containing 1 to 25 carbon atoms and X is either a carboxyl, a mercapto, a hydroxyl or a secondary amino group.

3,567,686

POLYCARBONATES

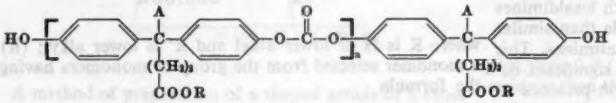
Ronald E. White, Romeo, and Zachariah G. Gardlund, Utica, Mich., assignors to General Motors Corporation, Detroit, Mich.

No Drawing. Filed Aug. 27, 1969, Ser. No. 853,495

Int. Cl. C08g 17/13

U.S. Cl. 260—47 3 Claims

Linear polycarbonate resins containing many pendant ester groups and possessing the general structural formula



wherein:

A is a radical selected from the group consisting of —H, $—CH_3$, and $—C_2H_5$;

R is an alkyl group containing one to eighteen carbon atoms and

n is an integer in the range of 40 to 70 inclusive,

are converted to the corresponding linear polycarbonate resins containing a large number of pendant hydroxyl groups only by reduction of the ester group with diborane (B_2H_6). The hydroxyl groups thus produced in the polycarbonate molecular chain are useful as grafting and cross-linking sites for further reaction with organic and organic-inorganic moieties to provide modified polycarbonates with enhanced physical properties.

3,567,687

HIGH MOLECULAR WEIGHT LINEAR POLYESTERS

Hermann Lohwasser, Eduard Radlmann, and Gunther Nischk, Dormagen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Oct. 24, 1968, Ser. No. 770,382

Claims priority, application Germany, Nov. 3, 1967, F 53,949

Int. Cl. C08g 17/08, 17/14

U.S. Cl. 260—49 6 Claims

High molecular weight linear polyesters produced by reaction of an organic acid dihalide with a fairly high molecular weight aromatic polyether containing sulfonyl groups and having terminal hydroxy groups.

3,567,688

POLYOXYMETHYLENIC COPOLYMERS

Gianfranco Pregaglia, Milan, Marco Binaghi, Varese, and Paolo Roffia, Mantova, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

No Drawing. Continuation-in-part of application Ser. No. 507,235, Nov. 10, 1965. This application Mar. 19, 1968, Ser. No. 714,354

Int. Cl. C08g 1/16

U.S. Cl. 260—67 7 Claims

Polyoxymethylenic copolymers having superior properties consisting of repeating oxymethylenic units and of oxyalkylenic units formed by opening of substantially only one of the rings of 2,3-ethylene-dioxydioxane.

Polyoxymethylenic copolymers prepared by reacting trioxane with 2,3-ethylenedioxydioxane.

3,567,689

POLYMER BLENDS OF AMINO-FORMALDEHYDE PREPOLYMERS AND DIVALENT METAL SALTS OF DIBASIC ORGANIC ACIDS

James Economy, Buffalo, Luis C. Wohrer, Lewiston, and John H. Mason, Clarence, N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

No Drawing. Original application Mar. 19, 1964, Ser. No. 353,266, now Patent No. 3,418,273, dated Dec. 24, 1968. Divided and this application June 24, 1968, Ser. No. 751,647

Int. Cl. C08g 9/28, 9/30

U.S. Cl. 260—67.6 6 Claims

Metal salts of alkanedioic and aromatic dibasic acids are used to improve one or more of the physical properties of certain thermoplastic and thermosetting resins, either before or after exposure to high temperatures.

3,567,690

COPOLYMERS HAVING PREVAILING POLYOXYMETHYLENE STRUCTURE, PRODUCTS DERIVED THEREFROM, AND PROCESSES FOR PRODUCING SAID COPOLYMERS

Gianfranco Pregaglia, Milan, Paolo Roffia, Mantova, and Valentino Zamboni, Arsizio, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

No Drawing. Filed Feb. 24, 1967, Ser. No. 618,349

Claims priority, application Italy, Feb. 25, 1966, 4,330/66

Int. Cl. C08g 1/18, 11/00

U.S. Cl. 260—73 12 Claims

Preparation of new polyoxymethylene copolymers consisting of at least 95% of oxymethylene units separated by oxyalkylenic units bound to side groups containing double bonds; these products have a low viscosity in the molten state since practically no cross-linking occurs during the reaction of copolymerization. A controlled cross-linking of the copolymers is then carried out through the olefinic double bond present therein to obtain products with increased viscosity in the molten state or having the characteristics of a thermosetting resin.

3,567,691

MALEINIZATION OF SYNTHETIC RUBBER

Adriaan W. van Breen, Pieter Luijk, Jacobus M. Rellage, and Christiaan Vervloet, Delft, Netherlands, assignors to Shell Oil Company, New York, N.Y.

No Drawing. Filed Apr. 7, 1967, Ser. No. 629,117

Claims priority, application Netherlands, May 24, 1966, 6607078

Int. Cl. C08d 5/02

U.S. Cl. 260—78.4 8 Claims

Conjugated diene homopolymers having improved green strength properties and satisfactory vulcanizate properties are prepared by masticating a solvent free polymer at 50–300° C. and injecting during mastication a solution of maleic anhydride in an amount of 0.01–1 phr.

3,567,692

POLYMERIC MATERIALS PRODUCED BY INTERACTING POLYISOCYANATE AND WATER IN THE PRESENCE OF POLYALDIMINE OR POLYKETIMINE

Geoffrey Arthur Haggis, Ronald Wynford Kenyon, and Vincent Kerrigan, Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Original application Jan. 29, 1964, Ser. No. 341,114, now Patent No. 3,420,800, dated Jan. 7, 1969. Divided and this application Mar. 26, 1968, Ser. No. 716,706

Claims priority, application Great Britain, Feb. 4, 1963, 4,507/63; Aug. 29, 1963, 34,223/63

Int. Cl. C08g *22/00*

U.S. Cl. 260—75 11 Claims

A process for the manufacture of isocyanate-based polymers which comprises interacting at least one organic polyisocyanate and water in the presence of a sterically hindered bisaldimine or bisketimine derived from an amine containing two primary amino groups. The solutions of isocyanates containing such bisaldimines or bisketimines are significantly more stable than similar solutions containing other aldimines or ketimines. This increased stability is obtained without any significant decrease in the speed of polymer formation in presence of water or loss of desirable properties in the polymers, for example, surface coatings, so obtained.

3,567,693

PROCESS FOR PREPARING POLYESTER FILM HAVING IMPROVED SLIP PROPERTIES

Aleksander Piirma, 3528 Adeline Drive, Stow, Ohio 44224

No Drawing. Continuation-in-part of application Ser. No. 624,163, Mar. 20, 1967, which is a continuation-in-part of application Ser. No. 329,863, Dec. 11, 1963. This application Dec. 6, 1968, Ser. No. 782,006

Int. Cl. C08g *17/01*

U.S. Cl. 260—75 5 Claims

The invention relates to a method of preparing a polyester resin having finely divided particles dispersed therein by adding a soluble alkaline earth metal compound and a free dicarboxylic acid to a glycol terephthalate and condensing the glycol ester to form high molecular weight resin. Films formed from the resins have good slip properties.

3,567,694

POLYESTERS, POLYAMIDES, AND POLYESTERAMIDES FROM ACRYL- OR METHACRYLIMINO DIACETIC ACID

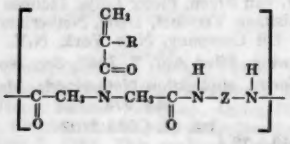
Donald E. Jefferson, Sykesville, and Nelson S. Marans, Silver Spring, Md., assignors to W. R. Grace & Co., New York, N.Y.

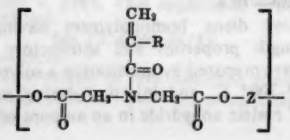
No Drawing. Filed Nov. 18, 1969, Ser. No. 877,856

Int. Cl. C08g *17/10, 20/00, 20/30*

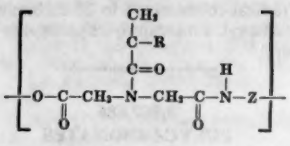
U.S. Cl. 260—75 1 Claim

A polymer having about 10–10,000 repeating monomeric units per molecule, said units being selected from the group consisting of



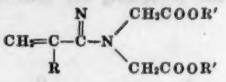


and



where R is hydrogen or a lower alkyl group and Z is an alkylene group having about 2–12 carbon atoms. This polymer is prepared by a process comprising:

(a) Forming a mixture of monomers consisting essentially of; (i) a monomeric diester having the formula



where R is H or lower alkyl and R′ is lower alkyl; (ii) a monomer selected from the group of monomers having the formula

$H_2N—Z—NH_2$, $H_2N—Z—OH$, and $HO—Z—OH$

where Z is a lower alkylene group having about 2–12 carbon atoms;

(b) Heating the mixture of monomers at about 50–150° C. to form the polymer and an alkanol byproduct while removing said alkanol as it is formed; and

(c) Recovering the polymer.

3,567,695

BLOCKED ISOCYANATE POLYMER (IV)

Thomas K. Brotherton and John W. Lynn, Charleston W. Va., assignors to Union Carbide Corporation

Application Nov. 9, 1964, Ser. No. 409,921, which is a continuation-in-part of application Ser. No. 212,480, July 25, 1962. Divided and this appiication Apr. 2, 1968, Ser. No. 718,094

Int. Cl. C08g *22/18*

U.S. Cl. 260—77.5 8 Claims

"Blocked" polyisocyanato-containing polymers which may be obtained via the vinyl polymerization of unsaturated diester diisocyanates as exemplified by bis(2-isocyanatoethyl) fumarate with/without ethylenically unsaturated compounds, e.g., styrene, vinyl acetate, etc., followed by reacting the polyisocyanato groups of the resulting polymers with a monofunctional active hydrogen compound. The above reactions may also be reversed to thus obtain the "blocked" polymers.

3,567,696

STORABLE POLYAMIDE-FORMING COMPOSITIONS AND PROCESS FOR THE PRODUCTION OF POLYAMIDES

Wilhelm August Sahler, Rheinbach, near Bonn, Germany, assignor to Dr. Plate GmbH, Chemische Fabrik, Bonn, Germany

No Drawing. Filed Mar. 6, 1968, Ser. No. 710,737

Claims priority, application Germany, Mar. 25, 1967, P 41,723

Int. Cl. C08g *20/18*

U.S. Cl. 260—78 3 Claims

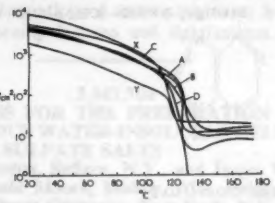
This invention relates to storable polyamide-forming compositions or mixtures of lactams comprising particular polymerization catalysts. Due to the particular polymerization catalysts the polyamide forming composition on the basis of polymerizable cyclic lactams may be stored at room temperature over prolonged periods of time and may nevertheless readily be polymerized by heating in the mould. This considerably simplifies the process for the production of polyamides from lactams.

3,567,697

METHOD OF PRODUCING ARTICLES OF CROSS-LINKED POLYETHYLENE

Robert Frederick Bates and Harry Brody, Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jan. 10, 1969, Ser. No. 790,285
Claims priority, application Great Britain, Jan. 23, 1968, 3,555/68
Int. Cl. C08f *1/60, 1/86, 27/00*
U.S. Cl. 260—78.4 15 Claims



A method of preparation of a shaped article of a cross-linked polyolefine, and in particular of crystalline polyethylene, which comprises melt-shaping a composition comprising

(i) 100 parts of a crystalline polyolefine having a crystalline melting point T_m,

(ii) 0.25 to 10 parts of a thermally activatable free-radical generator having a half-life ($t_{1/2}$) longer than 20 minutes at T_m plus 10° C. and

(iii) preferably from 1 to 20 parts of a polymerisable nonconjugated polyene,

under conditions at which not more than 60% of the free-radical generator is dissociated while the composition is at a temperature above T_m and therefore heating the shaped composition at a temperature below T_m at which the free-radical generator is dissociated and cross-linking occurs.

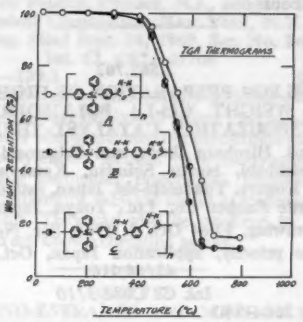
3,567,698

THERMALLY STABLE SILARYLENE-1,3,4-OXADIAZOLE POLYMERS SOLUBLE IN ORGANIC SOLVENTS

Hanna N. Kovacs, Kew Gardens, Alvin D. Delman, Old Bethpage, and Bernard B. Simms, Franklin Square, N.Y., assignors to the United States of America as represented by the Secretary of the Navy

Filed Sept. 2, 1969, Ser. No. 854,673
Int. Cl. C08g *31/32, 33/04, 47/00*
U.S. Cl. 260—78.4 10 Claims

Aromatic silicon-containing polyoxadiazoles that are soluble in organic solvents and are oxidation resistant and generally stable up to about 400° C. The polyoxadiazole poly[1,4 - phenylene(diphenylsilyl) - 1,4 - phenylene-2,5-(1,3,4-oxadiazole)] prepared by thermal cyclodehydration of the polyhydrazide obtained by copolymerization of bis(p - chlorocarbonylphenyl)diphenylsilane or bis(p-carbopentachlorophenoxyphenyl)diphenylsilane with either hydrazine or bis(p-carbohydrazidophenyl)diphenylsilane. Other polyhydrazide prepolymers are obtained by copolymerization of bis(p-carbohydrazidophenyl)diphenylsilane with dipentachlorophenyl terephthalate or dipentachlorophenyl isophthalate which yield poly[N-(p-diphenylsilylbenzoyl) - N,N'' - (terephthaloyl) - N''' - (p-benzoyl) dihydrazide] and poly[N-(p-diphenylsilylbenzoyl)-N,N''-(isophthaloyl)-N'''-(p-benzoyl)dihydrazide], respectively. These polyhydrazide prepolymers convert by thermal cyclodehydration into the polyoxadiazoles poly[1,4-phenylene(diphenylsilyl) - 1,4 - phenylene - (1,3,4 - oxadiazole-2,5 - diyl) - 1,4 - phenylene - 2,5 - (1,3,4 - oxadiazole)] and poly[1,4 - phenylene(diphenylsilyl) - 1,4 - phenylene-(1,3,4 - oxadiazole - 2,5 - diyl) - 1,3 - phenylene - 2,5-(1,3,4-oxadiazole)], respectively. The previously recited polyoxadiazole poly[1,4 - phenylene(diphenylsilyl) - 1,4-



phenylene-2,5-(1,3,4-oxadiazole)] is somewhat more heat resistant than the other oxadiazoles.

3,567,699

SULFUR-VULCANIZABLE COPOLYMERS OF ALPHA-OLEFINS AND POLYALKENYL-CYCLOALKANES AND PROCESS FOR PRODUCING SAME

Giulio Natta, Giorgio Mazzanti, Alberto Valvassori, and Vittorio Turba, Milan, Italy, and Guido Sartori, Roselle, N.J., assignors to Montecatini Edison S.p.A., Milan, Italy

No Drawing. Continuation of application Ser. No. 623,177, Mar. 8, 1967, which is a continuation-in-part of application Ser. No. 273,316, Apr. 16, 1963. This application Oct. 22, 1969, Ser. No. 868,650
Claims priority, application Italy, Apr. 18, 1962, 7,639/62
Int. Cl. C08f *15/40, 27/06*
U.S. Cl. 260—79.5 12 Claims

There are disclosed vulcanizable, substantially linear, substantially amorphous, high molecular weight copolymerizates of ethylene and/or a higher alpha-olefin having the general formula CH_2=CH—R in which R is an alkyl group containing 1 to 6 carbon atoms, and polyalkenylcycloalkanes containing 3 to 4 carbon atoms in the cycle.

3,567,700

SHORT STOPPING SYNTHETIC RUBBER POLYMERIZATION

Harry Elmer Albert and Paul Gordon Haines, Lafayette Hill, Pa., assignors to Pennwalt Corporation

No Drawing. Filed May 13, 1968, Ser. No. 728,806
Int. Cl. C08f *1/13;* C08d *1/09, 1/36*
U.S. Cl. 260—84.3 5 Claims

A process for shortstopping polymerizations, particularly polymerization processes for making synthetic rubber latices such as butadiene-styrene copolymers where the short stopping agent is diethylaniline N-oxide.

3,567,701

PROCESS FOR PREPARING POLYOLEFINS

Karl Diether Keil, Frankfurt am Main, Germany, assignor to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed May 1, 1968, Ser. No. 725,912
Claims priority, application Germany, May 20, 1967, F 52,468
Int. Cl. C08f *1/42, 3/06*
U.S. Cl. 260—88.2 1 Claim

The present invention relates to a process for the polymerization of ethylene or mixtures of ethylene with up

to 10% by weight of higher α-olefins in the presence of a mixed catalyst composed of a trivalent chlorine-containing titanium compound and an aluminium-organic component obtained by reacting acetylenes with aluminum hydrocarbons.

3,567,702

PROCESS FOR PREPARATION OF HIGH MOLECULAR WEIGHT CIS-1,4 POLYISOPRENE AND POLYMERIZATION CATALYST THEREFOR

Kan Mori, Hiroharu Ikeda, and Shigetoshi Hirayanagi, Yokkaichi-shi, Isamu Shimizu, Kameyama-shi, and Akira Kogure, Yokkaichi-shi, Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

No Drawing. Filed Oct. 3, 1968, Ser. No. 764,922

Claims priority, application Japan, Oct. 7, 1967, 42/64,416

Int. Cl. C08d *3/10*

U.S. Cl. 260—94.3 **3 Claims**

An improved process for preparation of a high-molecular-weight polyisoprene consisting principally of cis-1,4 units commercially advantageously at high yield by using a novel three-component catalyst composed of (A) a titanium halide, (B) an organoaluminium compound expressed by the formula AlR_3, wherein R is a member selected from the group consisting of alkyl groups, aryl groups and cycloalkyl groups, and (C) an aromatic compound selected from the group consisting of phenol, substituted phenols, hydroxy-substituted diphenyls, naphthols, said three-component catalyst being obtained by adding component (A) to a mixture of component (B) and component (C), and substituted naphthols.

3,567,703

METHOD OF PRODUCING STRAIGHT CHAIN WAXES BY CATALYTIC POLYMERIZATION OF ETHYLENE

Gert G. Eberhardt, Philadelphia, Pa., assignor to Sun Oil Company, Philadelphia, Pa.

No Drawing. Continuation-in-part of application Ser. No. 279,341, May 9, 1963. This application Feb. 27, 1969, Ser. No. 803,082

Int. Cl. C08f *1/76, 3/06*

U.S. Cl. 260—94.9 **19 Claims**

Polyethylene waxes with molecular weights of 1000–3000 and melting points of 100–125° C. are made by polymerizing ethylene at 101–150° C. employing a catalyst prepared by combining LiR with a non-aromatic tertiary amine which contains bridgehead nitrogen or which is a chelating diamine. The products have utility in paper coating compositions, floor polishes and the like.

3,567,704

PEROXIDES VIA THE PHOTOSENSITIZED OXIDATION OF CERTAIN NAVAL STORES RAW MATERIAL

Walter H. Schuller, 406 Oak Ave.; Jacob C. Minor, 10 Hillside Drive; and Ray V. Lawrence, 621 W. De Soto St., all of Lake City, Fla. 32055

No Drawing. Filed Feb. 18, 1969, Ser. No. 800,284

Int. Cl. C09f *7/02*

U.S. Cl. 260—97.5 **3 Claims**

This invention relates to the photosensitized oxidation of certain naval stores raw materials. More particularly, this invention relates to the photosensitized oxidation of certain naval stores raw materials to give new peroxides useful as initiators for the polymerization of styrenated unsaturated polyester laminating resins.

3,567,705

N-[δ-(6-PURINYLTHIO)VALERYL]AMINO ACIDS AND PEPTIDES

Antonín Černý, Miroslav Semonský, and Václav Jelínek, Prague, Czechoslovakia, assignors to Spofa, United Pharmaceutical Works, Prague, Czechoslovakia

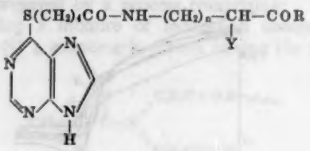
No Drawing. Filed June 26, 1967, Ser. No. 649,432

Claims priority, application Czechoslovakia, July 1, 1966, 4,436/66

Int. Cl. A61k *27/00*; C07c *103/52*; C07d *57/38*

U.S. Cl. 260—112.5 **15 Claims**

A compound of the general formula:



wherein:

n is an integer from 0 to 5;

R is a member selected from the group consisting of:

(a) alkoxy having a straight or branched chain of 1 to 8 carbon atoms;

(b) hydroxy;

(c) a residue of a peptidically attached amino acid;

(d) a residue of a dipeptide; the said amino-acid and dipeptide residues being in the form of their free carboxy acid;

(e) a residue as at (c) and (d) wherein the carboxy group is esterified with an alcohol, having a straight or branched chain of 1 to 7 carbon atoms;

Y is a member selected from the group consisting of:

hydrogen;

alkyl having a straight or branched carbon chain of 1 to 5 atoms;

phenyl;

3-indolyl;

$—CH_2OH$, $—CH_2SH$, $—(CH_2)SCH_3$ and

$$—(CH_2)_mCOR_1$$

m in the last member being an integer from 1 to 3 and R_1 being alkoxy having a straight or branched chain of 1 to 8 carbon atoms.

An example is N-[δ-(6-purinylthio)valeryl]glycine ethyl ester.

The compounds have shown an antineoplastic effect in certain specific transplantable mice tumors. They are distinguished by their high affinity to a particular organ or to the tissue of a particular organ and their acute and chronical toxicity is low.

3,567,706

REACTIVE AZO DYES CONTAINING A BENZOTRIAZINE-1-OXIDE

Kurt Brenneisen, Grenzach, Germany, Otmar Thumm, Basel, Switzerland, and Rudolf Wurster, Paterson, N.J., assignors to Sandoz Ltd., also known as Sandoz A.G., Basel, Switzerland

No Drawing. Filed Jan. 3, 1966, Ser. No. 523,497

Claims priority, application Switzerland, Dec. 31, 1964, 16,885/64; Nov. 25, 1965, 16,244/65

(Filed under Rule 47(a) and 35 U.S.C. 116)

Int. Cl. C09d *62/08*; D06p *1/02*

U.S. Cl. 260—153 **6 Claims**

Intermediates, 3-halo or hydroxy-1,2,4-benzotriazine-1-oxide-6- or -7-carboxylic acid or acid halide, are useful in the preparation of water-soluble reactive dyes having in their molecular structure, as a fiber-reactive group, at least one 3-halo-1,2,4-benzotriazine-1-oxide-6- or -7-carbonamido group.

3,567,707
DISAZO COUPLING PROCEDURE
Arthur S. Neave, Jr., Indian Hill, and Arthur J. Schroeder, Wyoming, Ohio, assignors to Sterling Drug, Inc., New York, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 492,872, Oct. 4, 1965. This application Apr. 4, 1968, Ser. No. 718,936
Int. Cl. C09b 31/14
U.S. Cl. 260—161 2 Claims
The process of coupling tetrazotized 3,3'-dichlorobenzidine with 3-methyl-1-p-tolyl-2-pyrazolin-5-one or 3-methyl-1-phenyl-2-pyrazolin-5-one at a pH of 0.5 to 1.0 results in the formation of known pigments having improved dry cleaning fastness and lightfastness.

3,567,708
PROCESS FOR THE PREPARATION OF FIBROUS WATER-INSOLUBLE CELLULOSE SULFATE SALTS
James H. Manning, Suffern, N.Y., and James W. Atkins and McDonald Moore, Mobile, Ala., assignors to International Paper Company, New York, N.Y.
No Drawing. Filed Aug. 25, 1969, Ser. No. 852,887
Int. Cl. C08b 5/14
U.S. Cl. 260—215 9 Claims
A process for producing a flame-resistant, water-insoluble, cellulose sulfate salt which comprises a sulfating step employing dimethyl sulfoxide or a dimethyl sulfoxide-dimethyl formamide mixture in the presence of sulfur trioxide in complex with a Lewis base, a neutralization step, a water-washing step and a de-swelling step using a salt containing a polyvalent cation.

3,567,709
METHOD OF PREPARING THE SODIUM SALT OF 6-(5-METHYL-3-PHENYL-4-ISOXAZOLECARBOXAMIDO)-PENICILLANIC ACID MONOHYDRATE
Marina Alexeevna Panina, Ul. Gorkogo 4, kv. 59; Valentina Alexandrovna Averianova, Pulkovskaya ul. 11, korp. 3, kv. 310; and Ivan Timofeevich Strukov, Balaklavsky prosp. 20, korp. 3, kv. 209, all of Moscow, U.S.S.R.
No Drawing. Filed Dec. 21, 1967, Ser. No. 692,330
Int. Cl. C07d 99/16
U.S. Cl. 260—239.1 4 Claims
A method of producing the sodium salt of 6-(5-methyl-3-phenyl-4-isoxazolecarboxamido)-penicillanic acid monohydrate by the acylation of 6-aminopenicillanic acid with 5-methyl-3-phenylisoxazole-4 carbonyl chloride in aqueous acetone solution and in the presence of sodium bicarbonate. The resultant sodium salt of 6-(5-methyl-3-phenyl-4-isoxazolecarboxamido)-penicillanic acid is converted into the free acid by acidifying the reaction mixture to a pH of 2.5–3, the acid thus obtained is extracted with butyl acetate, and the solution of 6-(5-methyl-3-phenyl-4-isoxazolecarboxamido)-penicillanic acid is treated with an equimolecular amount of sodium hydroxide in alcoholic solution.

3,567,710
PROCESS FOR THE PREPARATION OF 1,3-DIHYDRO-2H-1,4-BENZODIAZEPIN-2-ONES
Rodney Fryer, North Caldwell, and Leo H. Sternbach, Upper Montclair, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.
No Drawing. Filed June 3, 1968, Ser. No. 733,818
Int. Cl. C07d 53/06
U.S. Cl. 260—239.3 12 Claims
1,3-dihydro-2H-1,4-benzodiazepin-2-ones are prepared from corresponding substituted 2-aminobenzophenones by a multi-step process. The product compounds are known to be useful as tranquilizers, muscle relaxants, anti-convulsants and hypnotics.

3,567,711
PREPARATION OF α-HYDROXYLAMINO LACTAMS BY HYDROGENATION OF α-NITRO LACTAMS
Jan Frans Van Peppen, Chester, N.J., assignor to Allied Chemical Corporation, New York, N.Y.
No Drawing. Filed Sept. 30, 1969, Ser. No. 862,514
Int. Cl. C07d 41/06
U.S. Cl. 260—239.3 9 Claims
α-Nitrolactams can be catalytically hydrogenated using palladium-on-charcoal catalyst to afford C_5–C_{12} α-hydroxylamino lactams which are novel compositions of matter. These α-hydroxylamino lactams have biodynamic properties, including herbicidal, insecticidal, fungicidal, and acaricidal. Additionally, they are useful as transition metal chelating agents. They can also be oxidized to oximino lactams which are known chelating agents.

3,567,712
10β-AMINO-ESTRANES AND METHOD FOR THE PREPARATION THEREOF
Pietro de Ruggieri, Carmelo Gandolfi, and Umberto Guzzi, Milan, Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy
No Drawing. Filed Oct. 19, 1967, Ser. No. 676,601
Claims priority, application Italy, Oct. 31, 1966, 29,501/66
Int. Cl. C07c 169/24
U.S. Cl. 260—239.5 16 Claims
10β-amino-steroids of the estrane series and a method for the preparation thereof.

3,567,713
DERIVATIVES OF 2α,3α-EPITHIOANDROSTANE AND PROCESS FOR PREPARING THEM
Taichiro Komeno, Osaka-shi, Japan, assignor to Shionogi & Co., Ltd., Osaka, Japan
No Drawing. Filed Jan. 26, 1968, Ser. No. 700,719
Claims priority, application Japan, Jan. 28, 1967, 42/5,718
Int. Cl. C07c 173/00
U.S. Cl. 260—239.5 10 Claims
Hormonal (anabolic, myogenic, androgenic, uterotropic, antiuterotropic, antiestrogenic, contragestive, etc.) 17β-(1-alkoxycycloalkyl)oxy-2α,3α-epithio-5α-androstanes, for enteral and parenteral administration, pharmaceutical preparations containing one or more of them and process for preparing those compounds.

3,567,714
N-(OXA- OR THIACYCLOALKYL)METHYL-5-SULFAMOYLANTHRANILIC ACID DERIVATIVES
James W. Wilson, Wayne, Pa., assignor to Smith Kline & French Laboratories, Philadelphia, Pa.
No Drawing. Filed Sept. 3, 1965, Ser. No. 485,116
Int. Cl. C07d 5/04, 7/04, 63/04, 65/04
U.S. Cl. 260—239.6 6 Claims
Anthranilic acid derivatives, prepared by reacting a 2-halo-4-chloro(or bromo, fluoro or trifluoromethyl)-5-sulfamoylbenzoic acid or ester with an N-[(oxa- or thiacycloalkyl)methyl]amine, have diuretic and natriuretic activity and are useful in treating hypertension.

3,567,715
SULFANILAMIDOPYRIMIDINYLSULFONAMIDES
Aubrey A. Larsen, Frederick A. Grunwald, and William E. Kreighbaum, Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.
No Drawing. Filed Apr. 14, 1969, Ser. No. 816,037
Int. Cl. A61k 27/00; C07d 51/44
U.S. Cl. 260—239.75 7 Claims
N-methylalkanesulfonamido-substituted sulfanilamido pyrimidines and the pharmaceutically acceptable metal salts thereof are useful as short-acting antibacterial agents having a low hypersensitivity liability.

3,567,716

1,8-NAPHTHYRIDINE DERIVATIVES AND INTERMEDIATES THEREOF

Sadao Nishigaki, Tokyo, Takeo Naito, Ichikawa-shi, Yasuo Oshima, Tokyo, Renzo Dohmori, Chiba-gun, Senkichi Nagasaki, Chofu-shi, and Shizuo Kadoya and Isao Takamura, Tokyo, Japan, assignors to Daiichi Seiyaku Company, Limited, Tokyo, Japan

No Drawing. Filed May 31, 1967, Ser. No. 642,303
Claims priority, application Japan, June 14, 1966, 41/38,024; July 22, 1966, 41/47,638; Dec. 2, 1966, 41/78,658; Dec. 6, 1966, 41/79,554
Int. Cl. C07d *31/32, 31/28*
U.S. Cl. 260—240 25 Claims

These compounds, 1-substituted-1,4-dihydro-7-[2(5-nitro-2-furyl)vinyl]-4-oxo-1,8-naphthyridine-3 - carboxylic acids, are derivatives of 1,8-naphthyridine and are useful as antibacterial agents.

Lower-alkyl 4 - hydroxy-7-methyl-1,8-naphthyridine-3-carboxylate is reacted with 5-nitrofurfural to produce lower-alkyl 4 - hydroxy - 7-[2-(5-nitro-2-furyl)vinyl]-1,8-naphthyridine-3-carboxylate, then thus obtained product is hydrolyzed to produce 4-hydroxy-7-[2-(5-nitro-2-furyl)vinyl]-1,8-naphthyridine - 3 - carboxylic acid, and then various radicals are introduced into the 1-nitrogen atom of the 1,8-naphthyridine nucleus to produce 1-substituted-1,4-dihydro-7-[2-(5-nitro-2-furyl)vinyl] - 4 - oxo-1,8-naphthyridine-3-carboxylic acids.

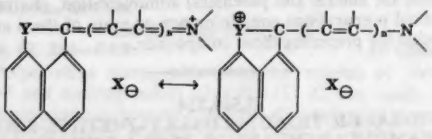
3,567,717

NEW CATIONIC DYESTUFFS AND PROCESSES FOR THEIR PREPARATION

Robert F. M. Sureau, Enghien-les-Bains, Gilbert V. H. Kremer, Ermont, and Marie-Josephe J. Alicot, Soisy-sous-Montmorency, France, assignors to Ugine Kuhlmann, Paris, France

No Drawing. Filed Aug. 9, 1968, Ser. No. 751,348
Claims priority, application France, Aug. 11, 1967, 117,725
Int. Cl. C09b *23/04*
U.S. Cl. 260—240 4 Claims

Dyestuffs are provided containing an atom grouping of the following formulae:



in which X represents a monovalent anion, Y represents an oxygen or sulphur atom and *n* represents 1 or 2. Processes for the preparation of these dyestuffs are also provided.

3,567,718

NOVEL DIETHYLAMINE COMPOUNDS AND MEANS FOR THEIR PRODUCTION

Edward F. Elslager, Ann Arbor, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

No Drawing. Filed Nov. 18, 1968, Ser. No. 776,800
Int. Cl. C07c *119/10;* C07d *33/54*
U.S. Cl. 260—240 3 Claims

N,N''-(p-phenylenedimethylidyne)bis[N' - [2-(diethylamino)-ethyl]-1,4-naphthalenediamine] and 5,5'-[p-phenylenebis(methylidyneimino)]bis[8 - [[2-(diethylamino)-ethyl]amino]-quinoline] are provided by reacting respectively N-[2-(diethylamino)ethyl] - 1,4-naphthalenediamine and 5-amino-8-[[2-(diethylamino)ethyl]amino]-quinoline with terephthalaldehyle. The products have antiparasitic properties and are useful schistosomacides.

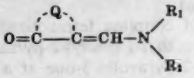
3,567,719

METHODS FOR PREPARING DYES AND NOVEL DYE INTERMEDIATES

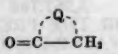
Carl H. Eldredge and John D. Mee, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed May 17, 1967, Ser. No. 639,050
Int. Cl. C09b *23/10*
U.S. Cl. 260—240.4 6 Claims

Novel compounds of the formula



where Q represents the atoms to complete a nucleus of from 5 to 6 atoms, and R_1 and R_2 each represents a lower alkyl group, the preparation of these compounds by heating a compound of the formula



with an inorganic acid halide and dialkyl formamide, and the preparation of merocyanine dyes with these compounds as starting material are described.

3,567,720

PROCESS FOR IMPROVING THE STORAGE STABILITY OF 2-(MORPHOLINOTHIO)-BENZOTHIAZOLE

Albert F. Hardman, 1759 Smith Road, Akron, Ohio 44313

No Drawing. Filed June 21, 1968, Ser. No. 738,778
Int. Cl. C07d *87/46*
U.S. Cl. 260—247.1 13 Claims

Actively contacting a liquid form of an impure 2-(morpholinothio)-benzothiazole product with a gaseous material to improve the storage stability of the 2-(morpholinothio)-benzothiazole.

3,567,721

INDAZOLECARBOXYLIC ACIDS AND DERIVATIVES THEREOF

Abraham Wajngurt, Riverdale, N.Y., assignor to Geigy Chemical Corporation, Ardsley, N.Y.

No Drawing. Filed Nov. 29, 1968, Ser. No. 780,170
Int. Cl. C07d *49/18*
U.S. Cl. 260—247.2 14 Claims

1-(o,o' - disubstituted benzoyl)indazole - 3 - carboxylic acids, esters and amides are anti-inflammatory and analgesic agents. An illustrative embodiment is 1-(2,6-dichlorobenzoyl)-3-carbomethoxy indazole.

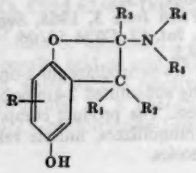
3,567,722

2-MORPHOLINO-3-SPIRO CYCLOALKENYL-5-HYDROXY-2,3 DIHYDRO BENZOFURANS

Kurt Ley, Helmut Walz, and Wolfgang Redetzky, Leverkusen, and Helmut Freytag, Cologne-Stammheim, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Continuation of application Ser. No. 634,783, Jan. 26, 1967, which is a division of application Ser. No. 550,899, May 18, 1966, now Patent No. 3,344,109, which in turn is a continuation-in-part of applications Ser. No. 267,930, Mar. 26, 1963, and Ser. No. 398,421, Sept. 22, 1964. This application Sept. 8, 1969, Ser. No. 856,924
Int. Cl. C07d *87/32*
U.S. Cl. 260—247.7 3 Claims

Compounds of the general formula



wherein the several R substituents are H or organic substituents, wherein R_1 and R_2 can form part of a carbocyclic ring, and R_4 and R_5 can be bonded to one another through a carbon or hetero atom bridge. The compounds are useful as age resister additives for rubber compositions.

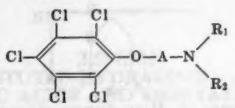
3,567,723

TERTIARY AMINOALKYL PENTACHLOROPHENYL ETHERS

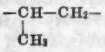
Shigeo Seki, Tokyo, and Tomio Matsuni, Yokohama-shi, Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

No Drawing. Filed May 17, 1967, Ser. No. 639,063
Claims priority, application Japan, May 21, 1966, 41/32,063
Int. Cl. C07d *87/32*
U.S. Cl. 260—247.7 **6 Claims**

Alkylaminoalkyl pentachlorophenyl ethers represented by the general formula:

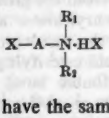


wherein A stands for a chain selected from the group consisting of ethylene, trimethylene and propylene



and R_1 and R_2 are selected from the group consisting of alkyl and aralkyl radicals but both of R_1 and R_2 cannot represent ethyl radical simultaneously; and R_1 and R_2 together with the adjacent nitrogen atom may form a heterocyclic ring selected from the group consisting of pyrrolidine, piperidine and morpholine, which are new and useful as fungicide.

A process for the production of alkylaminoalkyl pentachlorophenyl ethers of the above-mentioned general formula which comprises reacting an excess of an alkali metal salt of pentachlorophenol with a hydrohalogenic acid salt of an alkylaminoalkyl halide of the formula:



wherein A, R_1 and R_2 have the same meanings as defined above, respectively and X stands for a chlorine or bromine, in a solvent consisting of a lower alkyl alcohol or dioxane.

ERRATUM

For Class 260—248 see:
Patent No. 3,566,835

3,567,724

HEXAHYDRO-1,3,5-TRIS-(4-HYDROXYARYL)-s-TRIAZINES

Warren L. Beears, Brecksville, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

No Drawing. Filed Oct. 31, 1968, Ser. No. 772,363
Int. Cl. C07d *55/38*
U.S. Cl. 260—248 **7 Claims**

Novel hexahydro-1,3,5-tris-(4-hydroxyaryl)-s-triazines have been prepared. These compounds are effective stabilizers for organic materials, such as α-olefin polymers and copolymers, acetal polymers, polyamides, polyesters and polyurethanes, against the deleterious effects of oxygen, heat and light.

3,567,725

PROCESS FOR PREPARATION OF 1H-IMIDAZO-[4,5-b]PYRAZIN-2-ONES

Edward J. J. Grabowski, Iselin, Edward W. Tristram, Cranford, and Roger J. Tull, Metuchen, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed Nov. 20, 1968, Ser. No. 777,478
Int. Cl. C07d *51/76*
U.S. Cl. 260—250 **20 Claims**

A process is described for the preparation of 5-amino-(or substituted amino) - 6 - chloro - 1H - imidazo[4,5-b]-pyrazin-2-ones which comprises heating a 3 - amino - 5-amino(or substituted amino)-6-chloropyrazinoylaminimide either in a suitable solvent or as a solid until rearrangement and ring closure is complete. The products have utility as antihypertensive agents.

3,567,726

SYNTHESIS OF β,β-DI-ALKYL PYRROLIDINES

Robert D. Dillard and Nelson R. Easton, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Application July 12, 1967, Ser. No. 652,690, now Patent No. 3,452,015, dated June 24, 1969, which is a continuation-in-part of application Ser. No. 311,305, Sept. 25, 1963. Divided and this application Dec. 18, 1968, Ser. No. 810,875
Int. Cl. G07d *51/76*
U.S. Cl. 260—250 **1 Claim**

A propargyl is semi-hydrogenated to the corresponding allyl malonate which is hydrolyzed to the malonic acid. Decarboxylation of the acid is readily effected by heat, resulting in the production of an unsaturated acid which is readily cyclized to a 4-methyl-gamma lactone. The latter is converted to 2-methyl-beta,beta-substituted pyrrolidines via the corresponding 5-methyl-2-pyrrolidones.

3,567,727

6-(4-ALKYLPIPERAZIN-1-YL)PHENANTHRIDINES

Harry James Barber, Romford, Essex, and David Henry Jones, Rayleigh, Essex, England, assignors to May & Baker Limited

No Drawing. Filed Oct. 10, 1968, Ser. No. 767,060
Claims priority, application Great Britain, Oct. 11, 1967, 46,496/67
Int. Cl. C07d *51/70*
U.S. Cl. 260—268 **5 Claims**

6-(4-alkylpiperazin-1-yl)phenanthridines in which the alkyl group contains from one to six carbon atoms, and their non-toxic salts are active on the central nervous system as antidepressants and muscle-relaxants. They may be administered orally to an adult in a dose of, e.g., 50 to 500 mg. per day.

3,567,728

PROCESS FOR THE PREPARATION OF PHENAZINE DI-N-OXIDES AND RELATED COMPOUNDS

James David Johnston, Old Saybrook, and Marwan J. Abuel-haj, Groton, Conn., assignors to Pfizer Inc., New York, N.Y.

No Drawing. Filed July 5, 1968, Ser. No. 742,514
Int. Cl. C07d *51/80*
U.S. Cl. 260—267 **27 Claims**

A process for the preparation of phenazine-di-N-oxides which comprises reacting an isobenzofuroxan with a phenol in the presence of a base.

3,567,729

DIQUATERNARY AMMONIUM HALIDES

Morton Lewis, Elmhurst, and Thomas W. Findley, Chicago, Ill., assignors to Swift & Company, Chicago, Ill.

No Drawing. Continuation-in-part of application Ser. No. 553,019, May 26, 1966. This application Jan. 12, 1968, Ser. No. 697,291

Int. Cl. C07d *51/72*

U.S. Cl. 260—268 5 Claims

Quaternary ammonium salts are produced by reacting in the liquid phase, in the presence of water, tertiary amines and 1-halo, 2-hydroxy, 3-alkoxypropanes or by reacting tertiary amine hydrohalides and glycidyl ethers. The compositions possess surfactant properties and can be used as emulsifying agents, germicides, etc.

3,567,730

DIBENZOCYCLOHEPTATRIENE DERIVATIVES AND THEIR PREPARATION

Jean Clement Louis Fouche, Hauts-de-Seine, France, assignor to Rhone-Poulenc S.A., Paris, France

No Drawing. Filed June 15, 1966, Ser. No. 557,604

Claims priority, application France, June 18, 1965, 21,444; May 4, 1966, 60,266

The portion of the term of the patent subsequent to Nov. 25, 1986, has been disclaimed

Int. Cl. C07d *29/10, 27/02, 87/28, 51/70, 87/38*

U.S. Cl. 260—268 8 Claims

New 2 - substituted - 11 - aminoalkyldibenzo[a,d]cycloheptatrienes have useful pharmacodynamic properties as, inter alia, neuroleptics, sedatives, tranquilizers, antihistaminics, anti-emetics, and analgesics.

3,567,731

METAL NITROSYL HALIDE COMPLEXES

Donald H. Kubicek and Roger F. Kleinschmidt, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Filed Dec. 26, 1967, Ser. No. 693,067

Int. Cl. C07d *31/24;* C07f *11/00*

U.S. Cl. 260—270 7 Claims

A Group VI–B metal carbonyl complex is contacted with nitrosyl halide to produce a Group VI–B metal nitrosyl halide complex.

3,567,732

PROCESS FOR THE PREPARATION OF CHLORINATED QUINOLINES

Robert Joly, Montmorency, Julien Warnant, Neuilly-sur-Seine, and Bernard Goffinet, Paris, France, assignors to Roussel-UCLAF, Paris, France

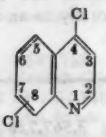
No Drawing. Filed Jan. 8, 1968, Ser. No. 696,135

Claims priority, application France, Jan. 10, 1967, 90,543

Int. Cl. C07d *33/14*

U.S. Cl. 260—283 1 Claim

This invention relates to a process for the preparation of chlorinated quinolines of the formula



wherein the chlorine attached to the benzene nucleus is in a position selected from the group consisting of the 5, 6, 7 and 8 positions. The said process involves reacting a 2, 3 or 4-chloroaniline with a compound selected from the group consisting of β-propiolactone and a compound of the formula

$$CH_2{=}CH{-}COOR$$

wherein R is selected from the group consisting of hydrogen and lower alkyl, cyclizing the 3-(chloroanilino)-propionic acid formed with polyphosphoric acid, chlorinating the resulting 5, 6, 7 or 8-chloro-4-oxo-1,2,3,4-tetrahydroquinoline with phosphorus oxychloride and recovering said chlorinated quinoline. The dichloroquinolines are known products useful as intermediates in the production of known compounds having therapeutic activity.

3,567,733

PROCESS FOR THE PREPARATION OF INTERMEDIATES FOR THE SYNTHESIS OF STEROIDS

Gerard Nominé, Noisy-le-Sec, France, and Arturo Bladé, Barcelona, Spain, assignors to Roussel-UCLAF, Paris, France

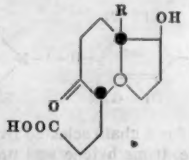
No Drawing. Filed Sept. 19, 1967, Ser. No. 668,954

Claims priority, application France, Sept. 22, 1966, 77,301

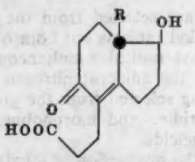
Int. Cl. C07d *33/48*

U.S. Cl. 260—287 14 Claims

This invention relates to a process for the preparation of 1β-hydroxy 5-oxo-4-(2′-carboxyethyl)-7aβ-R-3aα,4β,5,6,7,7a-hexahydroindanes of the formula



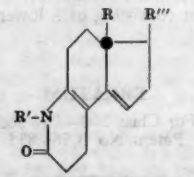
wherein R is lower alkyl, which comprises the steps of (1) subjecting a 1β - hydroxy-5-oxo-4-(2′-carboxyethyl)-7aβ-R-5,6,7,7a-tetrahydroindane of the formula



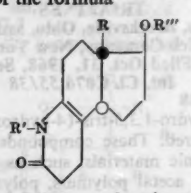
wherein R has the above-assigned value, to the action of a lactamizing agent of the formula

$$R''{-}COO^{\ominus}R'NH_3$$

wherein R′ is selected from the group consisting of hydrogen, lower alkyl and aryl-lower alkyl and R″ is lower alkyl, (2) esterifying the resultant lactam by the action of a lower alkanoic acid esterifying agent, (3) selectively reducing the 14–15 double bond of the resultant 17β-OR‴-13β-R-des-A-10-aza-$\Delta^{8,14}$-gonadiene - 5 - one of the formula



wherein R and R′ have the above-assigned values and R‴ is lower alkanoyl, by catalytic hydrogenation, (4) hydrolyzing the resultant 17β-OR‴-13β-R-des-A-10-aza-Δ^{8}-gonene-5-one of the formula



wherein R, R′ and R‴ have the above-assigned values, with a strong acid hydrolyzing agent, and (5) recovering

said 1β - hydroxy - 5 - oxo-4(2'-carboxyethyl)-7aβ-R-3aα, 4β,5,6,7,7a-hexahydroindanes. The latter is useful as an intermediate in the total synthesis of steroids.

3,567,734

QUATERNARY IMIDAZOLINIUM SALTS

Keith Liddell Johnson, Matteson, Ill., assignor to Swift & Company, Chicago, Ill.

No Drawing. Filed Oct. 20, 1966, Ser. No. 587,997
Int. Cl. C07d *49/34*; C07c *87/30*
U.S. Cl. 260—309.6 **2 Claims**

Preparation of cationic detergents comprising quaternization of a tertiary nitrogen atom of a fatty amine or a fatty imidazoline with polyalkylene glycol halide. Alternatively, a detergent composition is prepared by quaternization of a tertiary amine with a polyalkylene glycol halide, the hydroxyl group of which has been reacted with an epoxy group or carboxylic acid group.

3,567,735

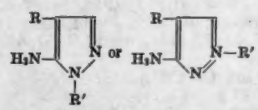
β - (SUBSTITUTED-HYDRAZINO) - α - CYANO ACRYLIC ACIDS AND DERIVATIVES, AND PROCESS FOR PREPARING N-SUBSTITUTED PYRAZOLES

Jean Druey, Riehen, and Paul Schmidt, Therwil, Switzerland, assignors to Ciba Corporation, New York, N.Y.

No Drawing. Division of application Ser. No. 452,908, May 3, 1965, now Patent No. 3,408,362, which is a division of application Ser. No. 815,824, May 26, 1959, now Patent No. 3,187,006, which is a continuation-in-part of application Ser. No. 775,356, Nov. 21, 1958, which in turn is a continuation-in-part of application Ser. No. 637,895, Feb. 4, 1957. This application Oct. 3, 1967, Ser. No. 672,428
Int. Cl. C07d *49/18*
U.S. Cl. 260—310 **1 Claim**

Process of reacting mono-substituted hydrazines with α-cyano-α-formyl-acetic acid esters or their reactive aldehyde derivatives, such as enol ethers, acetals or mercaptals and quite generally with α-cyano-α-formyl-acetic acid or its acid derivatives, or the reactive aldehyde derivatives thereof such as are mentioned above. Acid derivatives to be used are pimarily those which contain an oxo, thioketo, or imino group, such as esters, amides or amidines but also other derivatives may be used, such as the nitrile. Esters are preferably those of alkanols, such as lower alkanols, e.g. methanol, ethanol, propanol or butanol.

Also products having the formulae



wherein R stands for a carboxyl group or a derivative thereof and R' for the substituent of the hydrazine used for the reaction such as an alkyl, oxaalkyl, hydroxyalkyl, cycloalkyl, aryl or heterocyclic radical, useful as intermediates for preparing a variety of pyrazolo-pyrimidines. The invention also includes, as intermediates for the pyrazoles, β-(N_1-R-N_2-R''-hydrazino)-α-cyano-acrylic acid, its lower alkyl esters, amide, thioamide, amidine and nitrile in which R represents a member of the group consisting of lower alkyl, cycloalkyl, lower mono-hydroxyalkyl, lower alkoxy alkyl, phenyl, halophenyl, lower alkylphenyl, nitrophenyl and pyridyl, said cycloalkyl having from 5 to 6 carbon atoms and R'' represents a member selected from the group consisting of lower alkanoyl and arylidene.

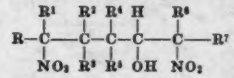
3,567,736

PROCESS FOR PRODUCING 2-PYRROLIDINONES

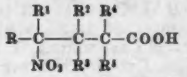
John M. Larkin, Hopewell Junction, and Kenneth L. Kreuz, Fishkill, N.Y., assignors to Texaco Inc., New York, N.Y.

No Drawing. Filed Dec. 18, 1967, Ser. No. 691,145
Int. Cl. C07d *27/08*
U.S. Cl. 260—326.5 **17 Claims**

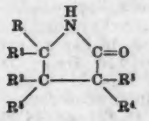
A method for preparing a 2-pyrrolidinone by contacting a dinitroalcohol having at least 5 carbon atoms corresponding to the formula:



with an acidic oxidizing agent at a pH not exceeding 4 thereby forming a 4-nitroalkanoic acid of the formula:



and thereafter hydrogenating the 4-nitroalkanoic acid in an alcoholic medium in the presence of a minor amount of a mineral acid and a hydrogenation catalyst preferably selected from the groups of platinum metals at temperatures ranging from about 20 to 200° C. and under hydrogen pressures of from 1 to 100 atmospheres. The 2-pyrrolidinones contemplated correspond to the formula:



and are useful as solvents for polymers, insecticides and petroleum processing and separation; as plasticizers for acrylic polymers and copolymers; and as decolorizing agents.

3,567,737

DERIVATIVES OF [2-CYCLOALKYL-1-PHENYL-3,4-DIHYDRONAPHTHALENES AND] 2 - CYCLOALKYL - 1 - PHENYL - 1,2,3,4 - TETRAHYDRONAPHTHALENES

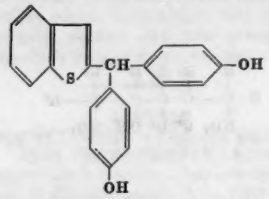
Daniel Lednicer, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed Jan. 2, 1968, Ser. No. 694,811
Int. Cl. C07d *27/02*; C07c *37/00*
U.S. Cl. 260—326.5 **9 Claims**

Derivatives of 2-cycloalkyl-1-phenyl-3,4-dihydronaphthalenes, cis- and trans-isomers of derivatives of 2-cycloalkyl - 1 - phenyl-1,2,3,4-tetrahydronaphthalene and processes for the preparation of the same. The novel compounds have utility as anti-fertility, estrogenic, anti-estrogenic, anti-spermatogenic, cholesterol lowering and lipid normalizing agents.

3,567,738
BIS(4-HYDROXYPHENYL)THIANAPHTHYL-2-METHANE
Ronald J. Meyer, Orville E. Horsley, and Herman J. Eichel, Cincinnati, Ohio, assignors to American Hoechst Corporation, New York, N.Y.
No Drawing. Filed June 26, 1968, Ser. No. 740,091
Int. Cl. A61k *27/00;* **C07d** *63/22*
U.S. Cl. 260—330.5 **1 Claim**

Bis(4 - hydroxyphenyl)thianaphthyl-2-methane having laxative (cathartic) properties of the formula:



and a process for preparing it.

3,567,739
PRODUCTION OF PURIFIED TETRABROMOPHTHALIC ANHYDRIDE
Joseph Eugene Sanger, St. Louis, Mich., assignor to Michigan Chemical Corporation, St. Louis, Mich.
No Drawing. Filed Oct. 4, 1968, Ser. No. 765,021
Int. Cl. C07c *63/18*
U.S. Cl. 260—346.3 **6 Claims**

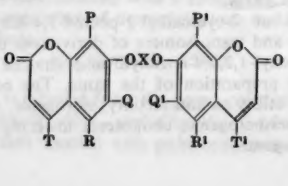
Tetrabromophthalic anhydride which had been produced in an acid medium such as oleum, is treated with dioxane to remove all of the residual acid, is washed with water and dried, preferably in an oven at about 110° C. The crystals are washed with the dioxane, not dissolved and recrystallized.

3,567,740
CYCLOPROPANECARBOXYLIC ACID ESTERS
Masanao Matsui, Tokyo, Kenzo Ueda Saitama-ken, Toshio Mizutani, Ikeda-shi, Nobushige Itaya and Shigeyoshi Kitamura, Minoo-shi, Akira Fujinami, Takarazuka-shi, Keimei Fujimoto, Kyoto, and Yositosi Okuno, Nishinomiya-shi, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan
No Drawing. Filed Aug. 21, 1967, Ser. No. 661,799
Claims priority, application Japan, Aug. 24, 1966, 41/55,974, 41/55,975
Int. Cl. A01n *9/24;* **C07c** *69/74;* **C07d** *63/10*
U.S. Cl. 260—347.4 **14 Claims**

New cyclopropanecarboxylates are prepared by reacting cyclopropanecarboxylic acid or acid halide or anhydride thereof with a primary alcohol.

3,567,741
BIS-COUMARINYL COMPOUNDS
Colin Fitzmaurice and Thomas Brian Lee, Holmes Chapel, England, assignors to Fisons Pharmaceuticals Limited, Loughborough, Leicestershire, England
No Drawing. Filed Nov. 21, 1968, Ser. No. 777,868
Claims priority, application Great Britain, Nov. 22, 1967, 53,077/67
Int. Cl. C07d *7/20*
U.S. Cl. 260—343.2 **9 Claims**

The invention provides the bis-coumarinyl compounds of the formula:



wherein Q, R, Q^1 and R^1 may be the same or different and each is selected from hydrogen; alkyl, alkoxy, substituted alkyl and alkoxy; hydroxy and halogen; P and P^1 are selected from hydrogen and acyl; T and T^1 may be the same or different and each is selected from alkyl and aryl; and X is a saturated or unsaturated, substituted or unsubstituted, straight or branched hydrocarbon chain, any carbon of which may be replaced by one or more carbocyclic or heterocyclic rings, carbonyl groups or oxygen atoms.

3,567,742
DIETHYL ALPHA-FLUORO-ALPHA-SUBSTITUTED MALONATES
Bruno Cavalleri, Milan, and Elvio Bellasio, Albate, Italy, and Emilio Testa, Ticino, Switzerland, assignors to Lepetit S.p.A. Gruppo per la Ricerca Farmaceutica, Milan, Italy
No Drawing. Filed May 3, 1968, Ser. No. 726,557
Claims priority, application Great Britain, May 12, 1967, 22,258/67
Int. Cl. C07c *69/76;* **C07d** *5/44*
U.S. Cl. 260—346.2 **3 Claims**

The invention is concerned with diethyl α-fluoro-α-arylmalonate and diethyl α-fluoro-α-(2-dibenzofuranyl)-malonate and a process for their preparation. The new substances possess high antiinflammatory activity.

3,567,743
NOVEL EPOXY ORGANIC ACIDS AND DERIVATIVES
Martin Anderson, Whitstable, Kent, England, assignor to Shell Oil Company, New York, N.Y.
No Drawing. Filed Aug. 13, 1968, Ser. No. 752,149
Claims priority, application Great Britain, Aug. 21, 1967, 38,435/67
Int. Cl. C07d *1/20, 1/22*
U.S. Cl. 260—348 **3 Claims**

Epoxycyclohexyl pentadienoyl compounds such as 3-methyl-5-(1,2-epoxy-2,6,6-trimethylcyclohexyl)-penta - 2, 4-dienoic acid, useful as plant growth regulants.

3,567,744
PROCESS FOR PRODUCING FUROIC ACID DERIVATIVES
Shizuya Tanaka, Minoo-shi, Japan, Hirosuke Yoshioka, Austin, Tex., and Akio Higo, Kobe, and Osamu Magara, Osaka, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan
No Drawing. Filed July 15, 1968, Ser. No. 744,693
Claims priority, application Japan, Aug. 14, 1967, 42/52,143, 42/52,144; Aug. 17, 1967, 42/53,029, 42/53,030
Int. Cl. C07d *5/18, 5/20*
U.S. Cl. 260—347.3 **10 Claims**

A novel process for producing 5-substituted 3-furoic acid derivatives useful as intermediates in a synthesis of insecticides. For example 5-benzyl-3-furoic acid is produced by reacting ethylene ketal of ethyl levulinate with ethyl formate in the presence of sodium hydride to yield ethylene ketal of ethyl α-formyl-levulinate, ring-closing the resultant ethylene ketal of ethyl α-formyl-levulinate by contacting it with hydrochloric acid to yield ethyl 5-methyl-3-furoate, brominating the resultant ethyl 5-methyl-3-furoate to yield ethyl 2-bromo-5-bromomethyl-3-furoate, reacting the resultant ethyl 2 - bromo-5-bromo-methyl-3-furoate with benzene in the presence of aluminum chloride to yield ethyl 2-bromo-5-benzyl-3-furoate and, after hydrolyzing the ester to an acid, reacting the resultant 2-bromo - 5 - benzyl - 3-furoic acid with zinc powder in an aqueous ammonia solution to yield 5-benzyl-3-furoic acid.

3,567,745

2-(2-AZIDO-N-METHYLACETAMIDO)-5-CHLORO-BENZOPHENONE

John Brammer Petersen, Haifa, Israel, assignor to W. R. Grace & Co., New York, N.Y.

No Drawing. Application Oct. 15, 1968, Ser. No. 767,838, now Patent No. 3,520,878, which is a continuation-in-part of application Ser. No. 579,500, Sept. 15, 1966. Divided and this application Aug. 5, 1969, Ser. No. 864,242

Claims priority, application Denmark, Sept. 17, 1965, 4,783/65

Int. Cl. C07c *117/00*

U.S. Cl. 260—349 1 Claim

In abstract, this invention is directed to a process for preparing diazepam, comprising subjecting 2-(2-azido-N-methylacetamido)-5-chlorobenzophenone to reductive cyclization, and recovering the thus formed diazepam, all as recited hereinafter.

3,567,746

N-ARYL BENZAMIDES

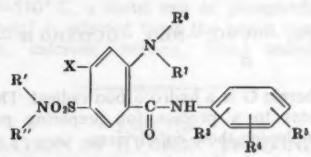
Bola Vithal Shetty, Rochester, N.Y., assignor to Pennwalt Corporation

No Drawing. Filed July 10, 1968, Ser. No. 743,615

Int. Cl. C07c *143/80*

U.S. Cl. 260—397.7 19 Claims

Compounds useful in preparing quinazolinone compounds having superior diuretic properties have the following generic formula:



or the pharmaceutically acceptable salts thereof, wherein X is halogen or trifluoromethyl; R′ and R″ are hydrogen, lower alkyl, phenylloweralkyl or phenyl; R^6 and R^7 are hydrogen, lower alkyl, phenyl, phenyl lower alkyl, amino lower alkyl, lower alkyl amino lower alkyl, lower alkanoyl or hydroxy lower alkyl, and R^3, R^4 and R^5 are hydrogen, lower alkyl, hydroxy, lower alkoxy, amino, lower alkoxy lower alkyl, halogen, sulfamyl or trifluoromethyl.

The above compounds are made, for example, by reacting 4-chloro-5-sulfamyl anthranilic acid with liquid phosgene in glacial acetic acid and the product dried over P_2O_5 to produce 7-chloro-6-sulfamylisatoic anhydride. This compound was then reacted with o-toluidine, p-chloroaniline, or other substituted aniline to give the amide of this invention.

3,567,747

SULFUR CONTAINING FATTY ACID DERIVATIVES AND PROCESS FOR THE PREPARATION OF SAME

Gordon G. Moore, Willow Grove, and Edward S. Rothman, Philadelphia, Pa., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Nov. 19, 1968, Ser. No. 777,169

Int. Cl. C07c *143/90*

U.S. Cl. 260—399 14 Claims

Sulfur containing fatty acid derivatives are prepared by reacting at a temperature range of from 70 to 200° C. the isopropenyl ester of a fatty acid containing from 14 to 18 carbon atoms with a mercaptan, a thiophenol, a thiol acid or a sulfonamide.

3,567,748

THE REACTION PRODUCT OF ISOPROPENYL STEARATE WITH DIETHYLMALONATE OR METHYL STEARATE AND THE CATALYZED PRODUCTION THEREOF

Edward S. Rothman, Philadelphia, Pa., assignor to the United States of America as represented by the Secretary of Agriculture

No Drawing. Continuation-in-part of application Ser. No. 549,806, May 13, 1966. This application Nov. 2, 1967, Ser. No. 680,052

Int. Cl. C11c *3/14*

U.S. Cl. 260—410.9 4 Claims

Isopropenyl stearate and a high boiling ester such as methyl stearate or diethylmalonate are heated in the presence of a proton-providing acid catalyst to produce a novel compound, described hereinafter, which functions as a chelating agent and is useful as a metal complexing agent.

3,567,749

PROCESS FOR THE PRODUCTION OF CARBOXYLIC ACID ESTERS FROM NITRILES WITH RECOVERY OF AMMONIA

Walter Neugebauer, Lothar Schmidt, and Gerhard Sperka, Konstanz (Bodensee), Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

No Drawing. Filed Aug. 8, 1966, Ser. No. 570,688

Claims priority, application Germany, Aug. 11, 1965, D 47,939

Int. Cl. C07c *67/00*

U.S. Cl. 260—468 15 Claims

Carboxylic acid esters are prepared by reacting carboxylic acid nitriles with alcohols in the presence of water in acid melt at a temperature between 90 and 300° C., the carboxylic acid ester and any unconverted nitrile and alcohol from the melt and heating the melt to a temperature between about 300 and 500° C. to drive off ammonia taken up by the acid salt.

3,567,750

REACTION PRODUCTS OF CERTAIN SILICON-CHLORINE-CONTAINING COMPOUNDS WITH THE REACTION PRODUCT OF A BORATE ESTER AND THE CHLORIDE OF CERTAIN METALS

Robert C. Wade, Ipswich, Mass., assignor to Ventron Corporation, Beverly, Mass.

No Drawing. Continuation-in-part of application Ser. No. 786,447, Dec. 23, 1968, now Patent No. 3,515,738, which is a continuation-in-part of application Ser. No. 670,417, Sept. 25, 1967, which in turn is a division of application Ser. No. 670,419, Sept. 25, 1967, now Patent No. 3,455,976. This application Dec. 23, 1968, Ser. No. 786,448

Int. Cl. C07f *7/00, 9/00, 15/02*

U.S. Cl. 260—429 20 Claims

The invention relates to products of unknown chemical structure prepared by reacting a borate ester such as trimethyl borate, triethyl borate, tripropyl borate, tributyl borate, trihexyl borate, trihexylene glycol biborate, trim,p-cresyl borate, and trimethoxylboroxine with a chloride of a metal selected from the group consisting of Ti(IV), Zr(IV), Hf(IV), Sn(IV), Al(III), Fe(III), Ga(III), In(III), Mo(V), Nb(V), Ta(V), and W(VI) in a molar ratio of at least 0.33 mole of the selected borate ester for each mole of the chloride of the selected metal in a substantially anhydrous diluent, such as an excess of the selected borate ester, methylene chloride, chloroform, and carbon tetrachloride, at a temperature between room temperature and about 200° C. until the reaction mixture ceases to give off organic chloride thereby forming a liquor comprising the diluent and a compound of complex chemical structure comprising the selected metal, boron, carbon, hydrogen, chlorine, and oxy-

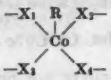
gen. Then there is added to said liquor a silicon-containing compound conforming to the formula Cl_nSiR_{4-n} where n is an integer from 1 to 4 and R is an alkyl or aryl radical in a molar quantity not greater than that of the chloride of the selected metal to react with said complex compound at a temperature between room temperature and about 200° C. thereby forming a second compound of complex chemical structure. The second compound of complex chemical structure may be isolated by removing volatile material from the reaction mixture by evaporation. Silicon tetrachloride, dimethyl-dichlorosilane, diphenyldichlorosilane and trimethylchlorosilane are illustrative of compounds conforming to the formula Cl_nSiR_{4-n}.

3,567,751
COBALT COMPLEXES AND PROCESS FOR PRODUCING THE SAME

Giacomo Costa and Giovanni Mestroni, Trieste, Italy, assignors to Snam Progetti S.p.A., Milan, Italy

No Drawing. Filed Feb. 16, 1968, Ser. No. 705,906
Claims priority, application Italy, Feb. 17, 1967, 12,760/67
Int. Cl. C07f *15/06*; B01j *1/10*
U.S. Cl. 260—439 **11 Claims**

A process for producing an organometallic tetradentate complex of cobalt by reacting an organometallic tetradentate complex of cobalt of the formula:



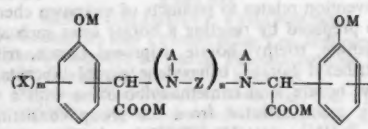
wherein X_1, X_2, X_3 and X_4, which form the tetradentate complex, may be the same or different and each represents a nitrogen, oxygen, sulphur or phosphorus atom; and R is an alkyl, aryl, alkaryl or cycloalkyl radical with carbon monoxide or nitrogen monoxide and with a mobile hydrogen compound represented by the formula R'H, said R' being an oxyalkyl, oxyaryl, oxycycloalkyl amino, hydroxy or mercaptan radical, in the presence of visible or ultraviolet radiation is disclosed. The resulting products are also disclosed and claimed. They find particular utility as catalysts in various organic reactions such as oxidations, oxo-reactions and nitrosations.

3,567,752
SUBSTITUTED HYDROXYETHYLGLYCINE COMPOUNDS

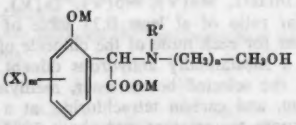
Nasser Israily, 8 Browne St., Brookline, Mass. 02146

No Drawing. Continuation-in-part of application Ser. No. 675,322, Oct. 16, 1967. This application Aug. 25, 1969, Ser. No. 852,901
Int. Cl. C07f *15/02*; C07c *101/72*
U.S. Cl. 260—439 **8 Claims**

Chelating agents of the formula



and



where A is hydrogen or —RCH—CH_2OH provided that at least one A is —RCH—CH_2OH; R is hydrogen or alkyl having up to 13 carbon atoms; R' is R or alkanol having up to 13 carbon atoms; Z is alkylene having 2 to 4 carbon atoms; X is alkyl or alkoxy having up to 13 carbon atoms, hydroxy, chloro or bromo; M is hydrogen, sodium, potassium, ammonium and amine derivatives; m is a whole integer equal to from 0 to the number of replaceable hydrogen atoms on the benzene nucleus and n is a whole integer of from 1 to 5.

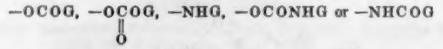
3,567,753
POLYSILOXANE-POLYOXYALKYLENE COPOLYMERS

Jean Claude Auguste Delaval and Paul Alfred Eugene Guinet, Lyon, Jean Marius Ernest Morel, Bron, and Robert Raphael Puthet, Lyon, France, assignors to Rhone-Poulenc S.A., Paris, France

No Drawing. Filed Dec. 15, 1967, Ser. No. 690,726
Claims priority, application France, Dec. 23, 1966, 88,710
Int. Cl. C07f *7/08*; C08f *11/04*; C09g *53/08*
U.S. Cl. 260—448.2 **9 Claims**

The invention relates to novel diorganopolysiloxane polyoxyalkylene copolymers of formula:

wherein R and R' are lower alkyl or cycloalkyl or aryl groups, n is between 2 and 700, q is 0 or an integer up to 3, the group R"O is $A(—CH_xH_{2x}O—)_y$, wherein x is an integer from 2 to 4, y is an integer of at least 1 and A is a formyloxy,



group wherein G is a hydrocarbon radical. The invention also relates to a process for preparing polyurethane foams employing these copolymers.

3,567,754
ALKYLMETHYLSILANES

Richard W. Alsgaard, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

No Drawing. Filed Aug. 15, 1968, Ser. No. 752,778
Int. Cl. C07f *7/08*
U.S. Cl. 260—448.2 **4 Claims**

Alkylmethylsilanes and alkyldimethylsilanes having alkyl groups of 12 to 45 carbon atoms are disclosed. The alkylmethylsilanes are useful as evaporation retardants.

3,567,755
PRODUCTION OF ORGANO-SILICON COMPOUNDS

Klaus Seyfried, Cologne, Hans-Horst Steinbach, Schildgren, and Walter Noll, Opladen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed May 23, 1968, Ser. No. 731,648
Claims priority, application Germany, May 27, 1967, F 52,522
Int. Cl. C07f *7/08, 7/18*
U.S. Cl. 260—448.2 **7 Claims**

In a process for production of an organo-silicon compound by the addition of a hydrogen-silane or -siloxane to an olefinically-unsaturated organic compound in the presence of a catalyst, the catalyst according to the invention is hexamethyl-dipyridnne-diplatinum diiodide of the formula

3,567,756

PRODUCTION OF LOWER TRIALKOXY SILANES

Wilfried Rothe, Strotzbach, Germany, assignor to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

No Drawing. Filed Sept. 4, 1968, Ser. No. 757,455
Claims priority, application Germany, Sept. 6, 1967, P 16 43 885.0
Int. Cl. C07f 7/04
U.S. Cl. 260—448.8 7 Claims

Alkoxy silanes are produced by reacting silicochloro form with the corresponding alkanols in aromatic solvents at temperatures between −40 and −90° C. while continuously passing an inert gas through the reaction mixture to remove the HCl formed.

3,567,757

PROCESS FOR PREPARING OMEGA-AMINOALKANENITRILES

Kenzaburo Ida, 19, 2-chome, Matsuzono-cho, Mizuho-ku; Seiya Suzuki, 8 Denjiyama, Narumi-cho, Midori-ku; Yasuo Iizuka, 64, 1-chome, Shijo-cho, Minami-ku; Tsutomu Setsuda, 64, 1-chome, Shijo-cho, Minami-ku; and Shin-ichi Taira, 31 Yakushiyama, Narumi-cho, Midori-ku, all of Nagoya, Japan

No Drawing. Filed Feb. 2, 1968, Ser. No. 702,523
Int. Cl. C07c 121/02
U.S. Cl. 260—465.2 4 Claims

Process for preparing omega-aminoalkanenitriles which comprises dehydrating the corresponding lactams in the presence of an excess of ammonia in the vapor phase with the aid of a dehydrating catalyst obtained by calcining at 300–550° C. a metal salt of phosphoric acid, in which a metal is selected from the group consisting of magnesium, calcium, barium, zinc, cadmium and aluminum.

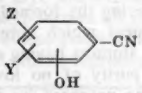
3,567,758

PREPARATION OF HYDROXYBENZONITRILES

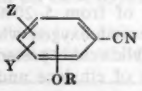
Basil Jason Heywood, Dagenham, England, assignor to May & Baker Limited, Essex, England

No Drawing. Filed May 2, 1968, Ser. No. 726,225
Claims priority, application Great Britain, May 5, 1967, 21,145/67; Aug. 25, 1967, 39,302/67
Int. Cl. C07c 121/74
U.S. Cl. 260—465 16 Claims

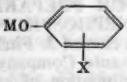
Hydroxybenzonitriles of the general formula:



wherein Y represents hydrogen or halogen, or alkyl of from 1 through 4 carbon atoms, and Z represents hydrogen or halogen, or alkyl of from 1 through 4 carbon atoms, or alkali metal salts thereof, are prepared by dealkylating an alkoxybenzonitrile of the general formula:



(wherein R represents alkyl of from 1 through 4 carbon atoms) by reaction with a phenol derivative of the general formula:



(wherein M represents hydrogen or an atom of an alkali metal, and X represents hydrogen or halogen, or alkyl of from 1 through 4 carbon atoms) and, when M represents an alkali metal atom, optionally converting the alkali metal salt of hydroxybenzonitrile product thus obtained into the hydroxy compound.

3,567,759

DIMERIZATION OF ACRYLONITRILE

Victor Tullio, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 256,227, Feb. 5, 1963. This application Apr. 30, 1963, Ser. No. 277,030
Int. Cl. C07c 121/02, 121/20
U.S. Cl. 260—465.8 8 Claims

Alpha-methyleneglutaronitrile is prepared by dimerizing acrylonitrile in the presence of tertiary phosphine catalysts.

3,567,760

PROCESS FOR DIMERIZATION OF UNSATURATED NITRILES UTILIZING A NITROGEN-CONTAINING CATALYST

Julian Feldman, Bernard A. Saffer, and Jack Kwiatek, Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

No Drawing. Filed Dec. 27, 1967, Ser. No. 693,711
Int. Cl. C07c 121/26
U.S. Cl. 260—465.8 7 Claims

A process for dimerization of unsaturated nitriles in which a nitrogen-containing compound is employed as the catalyst. The preferred catalyst systems comprise tertiary amines or quaternary ammonium compounds in the presence of an alcohol.

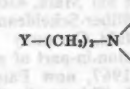
3,567,761

OXALIC ACID SALTS OF N-DIALKYLAMINO-ETHYL-α-(NAPHTHYL - 1) DELTA-PENT-4-ENOIC ACID

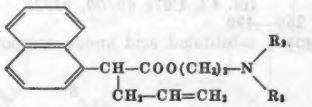
Etienne Szarvasi, Ecully, and Michel Bayssat, Lyon, France, assignors to Lipha, Lyonnaise Industrielle Pharmaceutique

No Drawing. Original application Mar. 18, 1964, Ser. No. 352,963, now Patent No. 3,334,096, dated Aug. 1, 1967. Divided and this application Apr. 3, 1967, Ser. No. 627,682
Int. Cl. C07c 69/76
U.S. Cl. 260—469 3 Claims

Acid salts of esters of α-(1-naphthyl)-delta-pent-4-enoic acid are obtained by the reaction of the acid with an amino derivative of the formula



wherein R_2 and R_3 are lower alkyl radicals and Y is selected from the group consisting of the halogens and the hydroxy radical to obtain esters of the formula



which can then be converted to the acid salts.

3,567,762

PALLADIUM CATALYZED DIMERIZATION OF 1,2-ALKADIENES

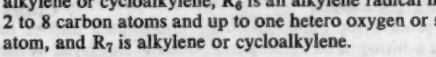
George D. Shier, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Mar. 22, 1967, Ser. No. 624,987
Int. Cl. C07c 67/04
U.S. Cl. 260—476 9 Claims

1,2-alkadienes dimerize in the presence of a palladium II salt and an organic carboxylic acid to form a mixture of 1,3-butadiene derivatives including mono- and diesters. These dimers are reactive monomers, cross-linking agents and dienophiles.

3,567,763
ESTER POLYISOCYANATES
William D. Emmons, Huntingdon Valley, and Jerome F. Levy, Bethayres, Pa., assignors to Rohm & Haas Company, Philadelphia, Pa.
No Drawing. Filed Jan. 6, 1966, Ser. No. 518,977
Int. Cl. C07c 69/00
U.S. Cl. 260—478 6 Claims

There are provided ester isooctanes having the formulae



and

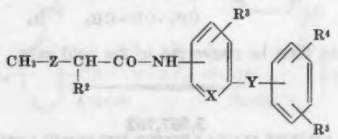
wherein m and n are either one or two, R_1 is the diester residue of an alkane or cycloalkane diol having two primary hydroxyl groups, from 2 to 18 carbon atoms, and up to one hetero oxygen or sulfur atom, R_2 and R_3 are alkylene or cycloalkylene, R_6 is an alkylene radical having 2 to 8 carbon atoms and up to one hetero oxygen or sulfur atom, and R_7 is alkylene or cycloalkylene.

3,567,764
HERBICIDAL ALKYLCARBAMOYLOXY-PHENYL BIURETS
Richard K. Brantley, Westminster, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed Apr. 12, 1968, Ser. No. 721,056
Int. Cl. C07c 127/24
U.S. Cl. 260—479 2 Claims

Alkylcarbamoyloxyphenyl biurets such as 5-[3-(t-butylcarbamoyloxy)phenyl]-1,3-dimethylbiuret and 5-[3-(cyclohexylcarbamoyloxy)phenyl] - 3 - ethyl - 1,1 - dimethylbiuret are useful as selective herbicides.

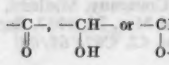
3,567,765
N-AROMATIC SUBSTITUTED ACID AMIDES AND ESTERS
Kurt Thiele, Frankfurt am Main, Germany, assignor to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany
No Drawing. Continuation-in-part of application Ser. No. 682,616, Nov. 13, 1967, now Patent No. 3,474,107, dated Oct. 21, 1969. This application July 10, 1969, Ser. No. 840,816
Claims priority, application Germany, Nov. 19, 1966, D 51,561; Sept. 1, 1967, D 53,982
Int. Cl. C07c 69/00, 93/26
U.S. Cl. 260—490 8 Claims

N-aromatic substituted acid amide compounds of the formula



wherein:

Z is



wherein the acyl is the acyl group of a lower aliphatic, preferably, alkyl carboxylic acid or of a monoaliphatic preferably, alkyl ester of carbonic acid,

R^2 is H or lower alkyl,

R^3 is H, halogen, lower alkyl or lower alkoxy,

each of R^4 and R^5 taken individually is hydrogen, halogen, lower alkyl, nitro, trifluoromethyl, lower alkoxy, lower alkyl amino, amino, hydroxy, acyl-oxy as defined above or acyl-amino as defined above,

X is =N— or =CH— and

Y is —CH_2— or —NH—

and wherein when Z is

X is CH and Y is NH at least one of R^2, R^3, R^4 and R^5 is other than hydrogen.

Such compounds have valuable pharmaceutical properties, such as, anti-inflammatory, analgesic, antipyretic and/or anti-spasmodic properties.

3,567,766
PREPARATION OF METHYL ACETATE
Richard E. Crocker, Anaheim, and John W. Wagner, Westminster, Calif., assignors to Atlantic Richfield Company, Philadelphia, Pa.
No Drawing. Filed Feb. 28, 1968, Ser. No. 708,757
Int. Cl. C07c 67/00
U.S. Cl. 260—491 6 Claims

A process for reacting methyl alcohol with vinyl chloride in the liquid phase in the presence of a $PdCl_2$ catalyst to produce methyl acetate is disclosed.

3,567,767
PROCESS FOR GAS PHASE SYNTHESIS OF VINYL ESTERS
Teruo Yasui and Seishiro Nakamura, Kurashiki, Japan, assignors to Kurashiki Rayon Co., Ltd., Kurashiki, Okayama Prefecture, Japan
No Drawing. Filed Dec. 9, 1966, Ser. No. 600,391
Claims priority, application Japan, Dec. 17, 1965, 40/77,266
Int. Cl. C07c 67/04
U.S. Cl. 260—497 10 Claims

An improved process for the preparation of vinyl esters by a process which comprises contacting a gaseous mixture composed of ethylene, oxygen, and organic aliphatic mono-carboxylic acid having up to 4 carbon atoms with a catalyst system composed of palladium, an acetate of an alkali metal on a catalyst carrier at an elevated temperature, and recovering the formed corresponding vinyl ester, the improvement which comprises employing as said catalyst carrier alumina having a surface area of 60–150 $m.^2/g.$ and a purity of no lower than 99%, said catalyst carrier being prepared by the steps comprising forming a basic aluminum sulfate sol by adding carbonate to an aqueous aluminum sulfate solution, heating the sol to gel the same, removing sulfate ions therefrom, drying and calcining the same at a temperature of 750 to 1100° C., the oxygen being present in said gaseous mixture in an amount of from 5–20% based on the sum volume of ethylene and oxygen while said organic aliphatic mono-carboxylic acid is present from 5–15% based on the sum volume of ethylene and oxygen.

3,567,768
PROCESS FOR PREPARING AMINO ALKYLENEPHOSPHONIC ACIDS
Chung Yu Shen and Steven J. Fitch, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.
No Drawing. Continuation of application Ser. No. 362,451, Apr. 24, 1964. This application Oct. 2, 1967, Ser. No. 672,393
Int. Cl. C07f 9/38
U.S. Cl. 260—502.5 12 Claims

Processes for preparing amino alkylenephosphonic acids by reacting a nitrogenous material such as ammonia, an organic carbonyl compound such as formaldehyde and

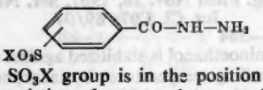
orthophosphorous acid in order to form such amino alkylene phosphonic acid, said reaction being carried out in the presence of a halide catalyst and the orthophosphorous acid is utilized 20% in excess of the stoichiometric amount required to react with the ammonia and formaldehyde.

3,567,769
SULFOBENZOYL HYDRAZIDES AND SALTS THEREOF

Andre Girard and Andre Ray, Paris, France, assignors to Roussel-UCLAF, Paris, France

No Drawing. Filed Dec. 20, 1967, Ser. No. 691,957
Claims priority, application France, Dec. 26, 1966, 88,827
Int. Cl. C07c *143/84*
U.S. Cl. 260—507 **4 Claims**

This invention relates to a sulfobenzoyl hydrazide of the formula



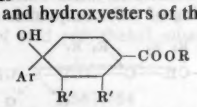
wherein the SO_3X group is in the position selected from the group consisting of meta and para and X is selected from the group consisting of hydrogen, a metal cation and an organic base. The sulfobenzoyl hydrazides of the invention are useful in the preparation of hydrazones of aldehydes, ketones or quinones, which hydrazones in the form of their alkali metal salts are very soluble in water.

3,567,770
ARYL SUBSTITUTED - HYDROXY SUBSTITUTED CYCLOHEXANECARBOXYLIC ACIDS AND ESTERS

George Karmas, Bound Brook, N.J., assignor to Ortho Pharmaceutical Corporation

No Drawing. Filed Aug. 2, 1967, Ser. No. 662,295
Int. Cl. C07c *101/72*
U.S. Cl. 260—519 **10 Claims**

Hydroxyacids and hydroxyesters of the formula:



wherein R is hydrogen or lower alkyl, R′ is lower alkyl and Ar is substituted aryl, are intermediates in the preparation of 2-lower alkyl-3-lower alkyl - 4 - arcyl - cyclohexenecarboxylic acids and esters which are active agents for the suppression of animal reproduction.

3,567,771
DIBASIC ACID

Herbert L. Wehrmeister, Terre Haute, Ind., assignor to Commercial Solvents Corporation, New York, N.Y.

No Drawing. Filed Feb. 27, 1967, Ser. No. 619,042
Int. Cl. C07c *65/02*
U.S. Cl. 260—521 **1 Claim**

This application relates to 2-(5-carboxypentyl)-4,6-dimethoxybenzoic acid and to a method for its preparation.

3,567,772
PROCESS FOR THE PRODUCTION OF ACRYLIC ACID

Masaya Yanagita, Tokyo, and Masao Kitahara, Chibashi, Japan, assignors to Toa Gosei Chemical Industry Co. Ltd., and Rikagaku Kenkyusho, both of Tokyo, Japan

No Drawing. Filed Mar. 27, 1967, Ser. No. 625,940
Claims priority, application Japan, Mar. 30, 1966, 41/19,846
Int. Cl. C07c *51/26*
U.S. Cl. 260—530 **8 Claims**

A high yield process for producing pure acrylic acid by the vapor phase oxidation of acrolein with molecular oxygen employing a highly active catalyst composition consisting of molybdenum, vanadium and aluminum oxides such as MoO_3, V_2O_5 and Al_2O_3 and at least one oxide of a metal such as Cu, Ge, U, Mn, Ba, Si, Au, Se, Co, Ti, Sr, Ag, Mg, B, Sn, W, Pb and As.

3,567,773
PRODUCTION OF UNSATURATED ALIPHATIC ACIDS

Goichi Yamaguchi and Shigeo Takenaka, Gunmaken, Japan, assignors to Nippon Kayaku Company, Ltd., Tokyo, Japan

No Drawing. Filed Mar. 29, 1967, Ser. No. 626,712
Claims priority, application Japan, May 21, 1966, 41/32,060
Int. Cl. C07c *51/26*
U.S. Cl. 260—530 **4 Claims**

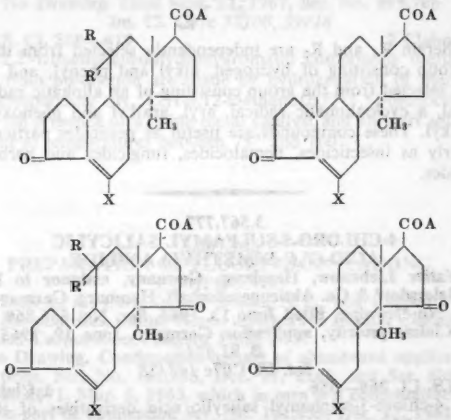
The vapor phase oxidation of olefinically unsaturated aldehydes such as acrolein to the corresponding olefinically unsaturated carboxylic acids such as acrylic acid in the presence of a mechanically stable oxidation catalyst composed of a form of the combined oxides of molybdenum, vanadium and tungsten, which catalyst is preferably on a silica carrier.

3,567,774
6-LOWER ALKYL-A-NOR-Δ^5-ANDROSTENE AND -$\Delta^{5,9(11)}$ANDROSTADIENE - 17 - CARBOXYLIC ACID HALIDES

Josef Fried, Princeton, N.J., assignor to E. R. Squibb & Sons, Inc., New York, N.Y.

No Drawing. Original application Sept. 13, 1963, Ser. No. 308,693, now Patent No. 3,393,230, dated Jan. 15, 1968. Divided and this application Dec. 13, 1967, Ser. No. 725,965
The portion of the term of the patent subsequent to Feb. 23, 1982, has been disclaimed and dedicated to the Public
Int. Cl. C07c *63/44*
U.S. Cl. 260—544 **1 Claim**

This invention relates to compounds of the formulae



wherein A is halogen; R is hydrogen; R′ is hydroxy; and together R and R′ is oxo; and X is lower alkyl. These compounds are useful as chemical intermediates in making compounds which possess anti-androgenic activity.

3,567,775
PROCESS FOR THE PREPARATION OF CYCLOPROPANECARBOXYLIC ACID FLUORIDE

Robert E. A. Dear, Convent Station, and Everett E. Gilbert, Morristown, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed May 8, 1967, Ser. No. 636,587
Int. Cl. C07c *51/58*
U.S. Cl. 260—544 **26 Claims**

This application relates to a novel process for the preparation of cyclopropanecarboxylic acid fluoride. This

process involves first reacting an alkali metal fluoride selected from the group consisting of potassium, cesium rubidium and sodium fluoride with a halobutyryl halide having the formula $X(CH_2)_3COX'$, where X and X' are halogens independently selected from the group consisting of chlorine and bromine. The resultant halobutyryl fluoride compound, $X(CH_2)_3COF$, is then reacted at a temperature above at least about 190° F. with an alkali metal fluoride selected from the group consisting of potassium, cesium and rubidium fluoride to produce cyclopropanecarboxylic acid fluoride. The two steps of this process are preferably carried out substantially simultaneously by conducting the first reaction above about 190° C. with an alkali metal fluoride selected from the group consisting of potassium, cesium and rubidium fluoride. Under these conditions the second reaction proceeds substantially simultaneously with the first.

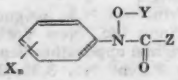
3,567,776

N-ARYL AMIDES

John Krenzer, Oak Park, and Sidney B. Richter, Chicago, Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

No Drawing. Filed Dec. 28, 1967, Ser. No. 694,042
Int. Cl. C07c *53/00, 63/04, 63/06*
U.S. Cl. 260—545 **7 Claims**

A compound of the formula:



wherein *n* is an integer of from 0 to 3; X is selected from the group consisting of halogen, an aliphatic radical, nitro, hydroxy, alkoxy and alkylsulfonyl and where Y is selected from the group consisting of alkyl and a carbamoyl radical of the formula:

wherein R_1 and R_2 are independently selected from the group consisting of hydrogen, alkyl and phenyl; and Z is selected from the group consisting of an aliphatic radical, a cycloaliphatic radical, aryl, aralkyl and phenoxyalkyl. These compounds are useful as pesticides particularly as insecticides, nematocides, fungicides and herbicides.

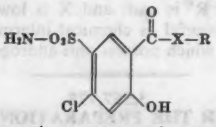
3,567,777

4-CHLORO-5-SULFAMYL SALICYLIC ACID-(2',6'-DIMETHYL) ANILIDE

Walter Liebenow, Hamburg, Germany, assignor to P. Beiersdorf & Co. Aktiengesellschaft, Hamburg, Germany

No Drawing. Filed June 13, 1966, Ser. No. 556,860
Claims priority, application Germany, June 19, 1965, B 82,474
Int. Cl. C07c *143/78*
U.S. Cl. 260—556 **1 Claim**

4-chloro-5-sulphamyl salicylic acid derivatives of the general formula:



in which X represents an oxygen atom or an NH— group and R represents an alkyl group having 1 to 3 carbon atoms, an unsubstituted phenyl residue, or a phenyl residue mono- or di-substituted by halogen atoms, trifluoro methyl-, hydroxyl-, nitro-, alkyl or alkoxy groups; and ammonium and alkali metal salts of the derivatives. A process for production of the compounds and pharmaceutical compositions containing them are also disclosed.

3,567,778

PROCESS FOR PREPARING NITROSALICYL-HYDRAZIDES

David F. Gavin, Cheshire, Conn., assignor to Olin Corporation

No Drawing. Filed June 17, 1968, Ser. No. 737,293
Int. Cl. C07c *103/33*
U.S. Cl. 260—559 **5 Claims**

The manufacture of nitrosalicylic hydrazides by the reaction of a hydrazine with lower alkyl esters of nitrosalicylic acid is improved by the addition to the reaction mixture of substantially stoichiometric amounts of an alkali metal hydroxide.

3,567,779

COLOR STABILIZED DIMETHYLETHANOLAMINE

Vernon A. Currier and Ada Lichaa, Austin, Tex., assignors to Jefferson Chemical Company, Inc., Houston, Tex.

No Drawing. Filed Nov. 20, 1967, Ser. No. 684,493
Int. Cl. C07c *89/04*
U.S. Cl. 260—584 **2 Claims**

Dimethylaminoethanol is stabilized against color change at its reflux boiling temperatures by incorporating in the dimethylaminoethanol a stabilizing amount of a mono- or di-lower alkanolamine.

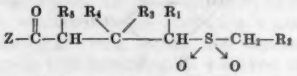
3,567,780

SUBSTITUTED METHYL-BUTYL-4-ONE SULFONES AND METHYL-BUTYL-2-ONE SULFONES

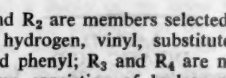
Jacques Martel, Bondy, and Chanh Huynh, Villemomble, France, assignors to Roussel-UCLAF, Paris, France

No Drawing. Original application June 30, 1965, Ser. No. 468,625, now Patent No. 3,398,160, dated Aug. 20, 1968. Divided and this application Apr. 8, 1968, Ser. No. 761,353
Claims priority, application France, July 3, 1964, 980,627
Int. Cl. C07c *49/76, 49/80*
U.S. Cl. 260—590 **4 Claims**

This invention relates to linear sulfones selected from the group consisting of (A) compounds of the formula



and (B) compounds of the formula



wherein R_1 and R_2 are members selected from the group consisting of hydrogen, vinyl, substituted vinyl, phenyl and substituted phenyl; R_3 and R_4 are members selected from the group consisting of hydrogen, alkyl, aralkyl, aryl and substituted aryl, and cycloalkyl having three to seven carbon atoms; R_5 is a member selected from the group consisting of hydrogen and lower alkyl; and Z is a member selected from the group consisting of R and OR, wherein R is a member selected from the group consisting of alkyl, aralkyl and aryl. These linear sulfones are useful as intermediates in the preparation of derivatives of tetrahydrothiapyran.

3,567,781

PROCESS FOR THE PREPARATION OF POLY AROMATIC ETHERS AND THIOETHERS

Frank S. Clark, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

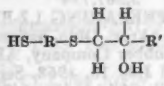
No Drawing. Filed Apr. 24, 1967, Ser. No. 632,920
Int. Cl. C07c *149/32, 41/04*
U.S. Cl. 260—609 **14 Claims**

A process for the preparation of a group of compounds representative of which are polyphenyl ethers, mixed polyphenyl ether-thioethers, phenoxybiphenyls and

phenoxyphenylmercaptobiphenyls comprising the steps of interacting an aromatic iodo, bromo or chloro compound with an alkali metal salt of an aromatic hydroxy compound in the presence of certain dipolar aprotic solvents representative of which are sec- and tert-amides, phosphorus amides and sulfones. The above compounds have many uses, among which are use as hydraulic fluids and jet engine lubricants.

3,567,782
HYDROXY CONTAINING THIOL SULFIDES
Paul F. Warner, Phillips, and Edward E. Huxley, Borger, Tex., assignors to Phillips Petroleum Company
No Drawing. Filed Aug. 8, 1968, Ser. No. 751,060
Int. Cl. C07c *149/18*; C09g *1/02*; B01j *1/16*
U.S. Cl. 260—609 2 Claims

Compounds represented by the formula



wherein R is an alkylene group of 1 to 5 carbon atoms and R′ is a saturated aliphatic hydrocarbon radical having from 10 to 20 carbon atoms, inclusive, are prepared by the reaction of a dimercaptan with a long chain epoxide. The compounds produced are suitable for prevention of tarnish on silver, copper, and other tarnishable metal.

3,567,783
PROCESS FOR PREPARING POLYPHENYL ETHERS
Gordon P. Brown, Schenectady, N.Y., assignor to General Electric Company
No Drawing. Filed Aug. 24, 1960, Ser. No. 51,500
Int. Cl. C07c *43/22*
U.S. Cl. 260—613 2 Claims

Polyphenyl ethers which have utility as lubricants, hydraulic fluids and heat transfer agents and process for the preparation of said polyphenyl ethers.

3,567,784
ALCOHOL ALKOXYLATES
William T. Tsatsos, San Mateo, Calif., Richard F. Schimbor, New Brunswick, N.J., and Rupert C. Morris Berkeley, Calif., assignors to Shell Oil Company, New York, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 661,546, Aug. 18, 1967. This application June 13, 1969, Ser. No. 833,160
Int. Cl. C07c *43/00*
U.S. Cl. 260—615 7 Claims

Certain ethylene oxide-propylene oxide-ethylene oxide derivatives of mixtures of C_{10}–C_{15} detergent range alcohols of critical ethylene oxide-propylene oxide ratios and critical ratios of ethylene oxide to carbon atoms in the alcohol moiety, useful as surfactants, exhibit superior physical properties such as high cloud points and low gel temperatures.

3,567,785
METHOD OF ISOLATING METHOXYETHYL-CHLORIDE
Wilhelm Vogt, Cologne-Sulz, Hermann Richtzenhain, Post Marialinden, Gemeinde Much, and Alfons Mersmann, Ranzel, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany
Filed Dec. 20, 1967, Ser. No. 691,997
Claims priority, application Germany, Dec. 30, 1966, D 51,917
Int. Cl. C07c *41/12*
U.S. Cl. 260—616 5 Claims

Separation of methoxyethylchloride from a mixture thereof with methanol, water and dichloroethane by liquid-liquid extraction with a halogenated hydrocarbon, an aromatic hydrocarbon, or an ether which is immiscible with water and with a mixture of methanol, dichloroethane and methoxyethyl chloride.

3,567,786
OXIDATION OF TERTIARY ALKYL-SUBSTITUTED ARYL COMPOUND TO TERTIARY ALCOHOL
Logan C. Bostian, William D. Griffin, and Zalik Oser, Morris Township, Morris County, N.J., assignors to Allied Chemical Corporation, New York, N.Y.
No Drawing. Continuation of application Ser. No. 165,960, Jan. 12, 1962. This application July 31, 1967, Ser. No. 659,559
Int. Cl. C07c *31/14*, *73/06*
U.S. Cl. 260—618 5 Claims

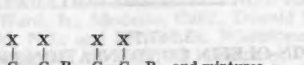
The production of tertiary alcohols by oxidizing a tertiary aliphatic carbon atom in an organic compound in which said tertiary carbon atom is attached to one carbon of a carbocyclic aryl nucleus, to one hydrogen atom, to two other saturated carbon atoms each in turn attached only to a member of the group consisting of carbon atoms and hydrogen atoms, in liquid phase with a gas containing elemental oxygen and with aqueous caustic of the group consisting of sodium hydroxide and potassium hydroxide in concentrations of about 40–90 weight percent in the aqueous solution and in proportions of about 20–400 grams of the aqueous caustic solution per 100 ml. of the compounds, at temperatures in the range of about 100° C.–300° C.

3,567,787
2,2′-TRIMETHYLENEDIHYDROXYAROMATIC SYNTHESIS
Henry E. Hennis, Coleman, Mich., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Sept. 22, 1967, Ser. No. 669,706
Int. Cl. C07c *37/00*, *39/16*
U.S. Cl. 260—619 7 Claims

2,2′-trimethylenedihydroxyaromatic compounds useful in resin production are made by hydrogenation of their corresponding 6H, 12H-6,12-methano[b,f][1,5]-dioxocin in the presence of a noble metal catalyst and an inert solvent at temperatures between 75° and 100° C.

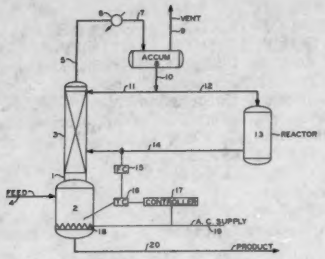
3,567,788
PREPARATION OF FLUORINE-CONTAINING COMPOUNDS
Russell L. K. Carr, Grand Island, N.Y., and Charles F. Baranauckas, Edina, Minn., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.
No Drawing. Continuation-in-part of abandoned applications, Ser. No. 161,255, Dec. 21, 1961, and Ser. No. 263,071, Mar. 5, 1963, which in turn is a continuation-in-part of application Ser. No. 161,255, Dec. 21, 1961. This application July 25, 1967, Ser. No. 655,744
Int. Cl. C07c *17/20*, *21/18*, *23/02*
U.S. Cl. 260—648 10 Claims

Compounds of the formulas



of these, wherein the R's are perhalogenated hydrocarbon radicals and the X's are halogens, are fluorinated with an alkali metal fluoride in an inert polar organic solvent, such as dimethylformamide or dimethyl sulfoxide.

3,567,789
PROCESS FOR THE PRODUCTION OF BIS(CYCLOALKENYL)-SUBSTITUTED OLEFINS
Roy C. Harrison, Bartlesville, Okla., assignor to Phillips Petroleum Company
Filed Nov. 10, 1969, Ser. No. 875,362
Int. Cl. C07c 5/00
U.S. Cl. 260—666 11 Claims



Bis(cycloalkenyl)-substituted olefins are prepared from alkenyl-substituted alkenes in a process where the feedstock and the raw product are simultaneously treated in a single fractionating vessel.

3,567,790
PROCESS FOR PRODUCING CYCLODODECENE
Migiho Morita, Yoshisuke Iwai, Jo Itakura, and Hiroo Ito, Nagoya, Japan, assignors to Toagosei Chemical Industry Co., Ltd., and Akira Misono, both of Tokyo, Japan
No Drawing. Filed Dec. 23, 1969, Ser. No. 887,786
Claims priority, application Japan, May 26, 1969, 44/40,765
Int. Cl. C07c 5/02
U.S. Cl. 260—666 5 Claims

An improved process for producing cyclododecene by selectively hydrogenating 1,5,9-cyclododecatriene with a hydrogen gas using as a catalyst a complex compound comprising a cobalt carbonyl and a tertiary phosphine, in which the hydrogenation is effected in the presence of a small amount of carbon monoxide thereby preventing the catalyst from degradation to obtain the desired product with advantages.

3,567,791
EXTRACTION PROCESS
Everett J. Fuller, Gillette, N.J., assignor to Esso Research and Engineering Company
No Drawing. Filed May 12, 1969, Ser. No. 823,958
Int. Cl. C07c 7/10
U.S. Cl. 260—674 18 Claims

A separation process in which aromatics are extracted from a feed stream by contacting said feed stream with a slurry. The slurry comprises a substance capable of forming an insoluble inclusion compound with the aromatic and a liquid solvent. The solvent has the capacity to solvent-extract the aromatics and to further permit the formation of separate liquid layers, one layer containing primarily feed stream depleted in aromatics, the other containing the solvent, enriched in aromatics and an insoluble inclusion compound.

3,567,792
DIOLEFIN-OLEFIN CONDENSATION PROCESS
John E. Bozik, Pittsburgh, Harold E. Swift, Gibsonia, and Ching Yong Wu, Pittsburgh, Pa., assignors to Ameripol, Inc., Cleveland, Ohio
No Drawing. Filed Dec. 26, 1968, Ser. No. 787,257
Int. Cl. C07c 3/00
U.S. Cl. 260—677 18 Claims

Process for the preparation of triolefins comprising condensing diolefins and olefins in contact with a catalyst system comprised of: (1) a nickel salt, (2) an organoaluminum compound and (3) a secondary phosphine ligand.

3,567,793
OXIDATIVE DEHYDROGENATION OF ORGANIC COMPOUNDS
Philip M. Colling and Johnny C. Dean, Houston, Tex., assignors to Petro-Tex Chemical Corporation, Houston, Tex.
No Drawing. Filed Sept. 28, 1967, Ser. No. 671,236
Int. Cl. C07c 5/18
U.S. Cl. 260—680 23 Claims

Oxidative dehydrogenation of organic compounds in vapor phase utilizing manganese ferrite. The manganese ferrite is formed in the presence of halogen.

3,567,794
PROCESS FOR PREPARING 1,2-BUTADIENE
Kenneth C. Eberly, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio
No Drawing. Filed July 18, 1968, Ser. No. 745,686
Int. Cl. C07c 11/16, 1/26
U.S. Cl. 260—680 9 Claims

The process disclosed herein comprises a method for preparing 1,2-butadiene by the zinc dust, etc. dehydrochlorination of dichlorobutene, specifically 2,3-dichloro-1-butene, or 1,2-dichloro-2-butene, or a mixture thereof. Such dichlorobutene can be prepared by the reaction of 1,2,3-trichlorobutane with solid KOH. Advantageously the trichlorobutane is prepared by the reaction of chlorine with either 1-chloro-2-butene or 3-chloro-1-butene or a mixture thereof. One of the advantages of the present process is the fact that 1,3-butadiene can be reacted with concentrated hydrochloric acid to give a mixture of the above mentioned monochlorobutenes. Thus the process provides a relatively inexpensive method of preparing 1,2-butadiene from 1,3-butadiene.

3,567,795
REFINING PROCESS OF HYDROCARBON POLYMER
Tetsuo Ishikawa and Yoshio Kadowaki, Tokyo, and Teruo Kajikawa and Shinji Uehara, Kawasaki, Japan, assignors to The Furukawa Chemical Industries Co., Ltd., Tokyo, Japan
No Drawing. Filed June 17, 1968, Ser. No. 737,323
Int. Cl. C07c 3/18
U.S. Cl. 260—683.15 6 Claims

Process of refining hydrocarbon polymers obtained by liquid phase polymerization with a Friedel-Crafts catalyst, wherein the polymer solution, containing catalyst, is contacted with an aqueous solution of a water-soluble salt selected from the group consisting of nitrates, sulphates, thiosulphates, phosphates, oxalates and silicates, making it possible to eliminate the catalyst as a decomposition product.

3,567,796
HYDROCARBON CONVERSION PROCESS WITH A HALOGENATED CATALYST UTILIZING HYDROCARBONS AND DERIVATIVES THEREOF IN ITS PREPARATION
John H. Estes and Robert M. Suggitt, Wappingers Falls, and Stanley Kravitz, Wiccopee, N.Y., assignors to Texaco Inc., New York, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 646,458, June 16, 1967, which is a continuation-in-part of application Ser. No. 600,021, Dec. 8, 1966. This application Apr. 2, 1969, Ser. No. 812,914
Int. Cl. C07c 5/30; B01j 11/78
U.S. Cl. 260—683.68 9 Claims

A hydrocarbon conversion process in which a hydrocarbon is contacted at conversion conditions with a catalyst consisting essentially of (1) alumina, (2) a metal

selected from the group consisting of ruthenium, rhodium, palladium and platinum, and (3) chlorine or bromine wherein at least a portion of said chlorine or bromine is introduced into said catalyst by contacting a composite of alumina and said metal at elevated temperature with a selected organic compound in the presence of chlorine or bromine. The catalyst so prepared is useful in hydrocarbon conversion processes as isomerization, hydrocracking, alkylation, hydrogenation and polymerization.

3,567,797

CURABLE COMPOSITIONS COMPRISING (A) A BIS(1,2 - EPOXYALKYL)CYCLOALIPHATIC COMPOUND, (B) A POLYETHER POLYEPOXIDE AND (C) A CURING AGENT

Frank D. Mango, Oakland, and Herbert A. Newey, Lafayette, Calif., assignors to Shell Oil Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 700,041, Jan. 24, 1968. This application Dec. 9, 1968, Ser. No. 782,445

Int. Cl. C08g *30/14, 45/00*

U.S. Cl. 260—830 **8 Claims**

Polymer compositions having improved physical properties are obtained by mixing a bis(1,2-epoxyalkyl)cycloaliphatic compound having at least 5 carbon atoms in the carbocyclic ring thereof with a polyether polyepoxide possessing more than one vic-epoxy group. The mixture may be cured through the use of conventional curing agents to produce polymeric compositions which are useful in the preparation of surface compositions, castings, and impregnating and sealing compositions.

3,567,798

BLOCK COPOLYMERS CONTAINING CERTAIN POLAR END BLOCKS

Walter R. Haefele, Orinda, and Alfred W. Shaw and Eugene T. Bishop, Moraga, Calif., assignors to Shell Oil Company, New York, N.Y.

No Drawing. Filed Feb. 28, 1967, Ser. No. 619,142

Int. Cl. C08f *15/00*

U.S. Cl. 260—880 **3 Claims**

Novel block copolymers exhibiting improved processability have the configuration A—B—A—C wherein the polymer blocks A are relatively low molecular weight vinyl arene blocks imparting good processability, B is a polymer block of a conjugated diene and C is a polymer block of certain polar polymerizable monomers selected from the group consisting of monovinyl pyridines, acrylic acid esters, methacrylic acid esters, acrylonitriles, methacrylonitriles, monovinylquinolines and acrylamides, imparting improved stress-strain properties. The subject block copolymers find particular utility in improved adhesive compositions.

3,567,799

METHOD OF PREPARING STABILIZED HIGH MOLECULAR WEIGHT POLYESTER RESIN BY CONDENSING LOW MOLECULAR WEIGHT POLYESTER RESIN AND PHOSPHOROUS CONTAINING POLYESTER RESIN

Dusan C. Prevorsek, Princeton, N.J., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Continuation of application Ser. No. 373,045, June 5, 1964. This application Jan. 25, 1968, Ser. No. 700,650

Int. Cl. C08g *17/133, 39/10, 51/58*

U.S. Cl. 260—860 **14 Claims**

The invention relates to process for stabilizing polyester resin by adding phosphorus modified polyester resin to a low molecular weight polyester resin and condensing to form high molecular weight polymer. Resins of improved stability are produced.

3,567,800

DIALKYL-2-(PHENALKOXYCARBONYL)-1-METHYLVINYL PHOSPHATE

Donald W. Stoutamire, Modesto, and Milton Silverman, La Habra, Calif., assignors to Shell Oil Company, New York, N.Y.

No Drawing. Filed Apr. 25, 1968, Ser. No. 724,240

Int. Cl. C07f *9/08;* **A01n** *9/36*

U.S. Cl. 260—941 **8 Claims**

Novel dialkyl 2-(phenalkoxycarbonyl) - 1 - methylvinyl phosphates substituted on the phenyl moiety by a sulfur-containing functional group, primarily useful as miticides.

3,567,801

AMINOALKYL PHOSPHONATES

Walter Stamm, Tarrytown, and Silvio L. Giolito, Whitestone, N.Y., assignors to Stauffer Chemical Company, New York, N.Y.

No Drawing. Filed Nov. 3, 1967, Ser. No. 680,301

Int. Cl. C07f *9/40*

U.S. Cl. 260—944 **1 Claim**

A composition of matter consisting of the reaction product of nitrogen containing alkylphosphonic acids and an alkylene oxide. The alkylene oxide can be selected from the group consisting of ethylene oxide, propylene oxide, butylene oxide, epichlorohydrin, 1,1,1-trichloropropylene oxide, styrene oxide, cyclohexene oxide, vinyl cyclohexene diepoxide and mixtures thereof. The compositions are useful as reactive flame retardants such as in the process of making polyurethane foam and can be used in mixtures or in lieu of polyalcohols.

3,567,802

PERFLUOROPOLYOXOALKANE SUBSTITUTED PHOSPHINATES

Bruce H. Garth, Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Dec. 3, 1968, Ser. No. 780,871

Int. Cl. C07f *9/32*

U.S. Cl. 260—950 **5 Claims**

Perfluoropolyoxoalkane substituted phosphinates having the formula $R_fO(C_3F_6O)_mCFXCH_2OP(:O)(C_6H_5)_2$ or

$$(C_6H_5)_2P(:O)OCH_2CFX(C_3F_6O)_mCFXCH_2OP(:O)(C_6H_5)_2$$

wherein R_f is a perfluoroalkyl group of 1–6 carbon atoms, m is an integer in the range 3–50, and X is —F or —CF_3, useful as high temperature lubricants and hydraulic fluids, and as corrosion and degradation inhibitors for poly(hexafluoropropylene oxide) oils having the formula

$$R_f(C_3F_6O)_nR'_f$$

$$R_fO(C_3F_6O)_nCF(CF_3)H, \text{ or}$$

$$R_fO[CF(CF_3)CF_2O]_nCF(CF_3)CF(CF_3)[OCF_2CF(CF_3)]_nOR_f$$

wherein R_f is as defined above, R'_f is a perfluoroalkyl group of 1–2 carbon atoms, and n is an integer, said oils also having an average molecular weight of at least 3,000, a pour point not in excess of 10° C., and a volatility of less than 50% at 204.4° C.

3,567,803

PREPARATION OF VINYL PHOSPHATES

Loyal F. Ward, Jr., Modesto, Calif., Donald D. Phillips, Westfield, N.J., and Richard R. Whetstone, Modesto, Calif., assignors to Shell Oil Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 302,446, Aug. 15, 1963. This application July 27, 1967, Ser. No. 656,366

Int. Cl. A01n *9/36;* **C07f** *9/08*

U.S. Cl. 260—972 **19 Claims**

Process for preparing insecticidal enol esters of acids of pentavalent phosphorus by reacting a halide of an acid

of pentavalent phosphorus with an alpha-haloketone in the presence of a base.

3,567,804
PROCESS OF MAKING LIGHT-POLARIZING FILMS FROM VINYL CHLORIDE POLYMERS
Yasunori Nishijima, Kyoto-shi, Sumio Takadono, Namerikawa-shi, Morio Watanabe, Uozu-shi, Taisuke Saito, Namerikawa-shi, and Kazuo Miyoshi, Uozu-shi, Japan, assignors to Nippon Carbide Kogyo Kabushiki Kaisha, Tokyo, Japan
No Drawing. Filed May 20, 1968, Ser. No. 730,506
Claims priority, application Japan, May 30, 1967, 42/33,960; June 1, 1967, 42/34,506; Oct. 21, 1967, 42/67,622; Oct. 23, 1967, 42/67,833
Int. Cl. B29d *11/00*; G02b *5/30*
U.S. Cl. 264—2 8 Claims

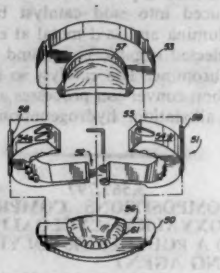
A solution comprising a vinyl chloride polymer, a specified weakly basic amine or nitrogen containing heterocyclic compound as conversion agent and a solvent is cast to prepare a sheet. The sheet containing said conversion agent is subjected first to heating and then to stretching or vice versa to obtain a light-polarizing film. The resulting product has a color of blue-purple-reddish orange and shows good dichroism throughout all of the visible spectrum. The product is uniform in optical properties over a wide area as well as excellent in chemical and mechanical properties. The dichroism can be varied in a wide range by changing the stretching ratio. The process is simpler than the prior processes, resulting in a lower cost of the product. The process involves a reaction throughout the polymer sheet producing a larger number of conjugated polyene linkages which are responsible for the light polarization phenomenon.

3,567,805
METHOD OF MAKING A PROPELLANT GRAIN CONTAINING METAL WIRE STAPLE
Everette M. Pierce, Somerville, Ala., assignor to the United States of America as represented by the Secretary of the Army
Filed Dec. 23, 1965, Ser. No. 516,167
Int. Cl. C06b *21/02*
U.S. Cl. 264—3 7 Claims

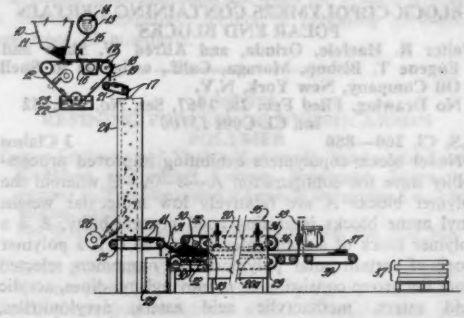
Staple-containing propellant pellet grains are prepared by intimately mixing metal staples with a binder, plasticizer and oxidizer, forming the mixture into small pellets with length approximately equal to diameter, mixing the staple-containing pellets with additional propellant ingredients at a proportion such that the staple-containing pellets comprise 5 to 70 weight percent of the mixture to form a viscous slurry, casting the slurry and curing the resulting grain. Burning characteristics and performance are substantially improved over grains prepared by previous slurry casting methods, because the staples are randomly oriented and not aligned parallel to the motor case wall or motor mandrel.

3,567,806
METHOD FOR MAKING TRAY DENTURES
John P. Dyal, 6006 N. Mesa, El Paso, Tex. 79912
Filed Apr. 22, 1968, Ser. No. 722,965
Int. Cl. A61c *9/00*, *13/04*
U.S. Cl. 264—18 3 Claims

An entire denture is prefabricated on a non-anatomical base tray. The tray is then at least partially covered with a self-conforming material and placed in a patient's mouth, thereby building an anatomical base conforming to the patient's alveolar ridges. Following this, the anatomical base is given a custom fit by means of suitable trimming and edge sealing. The invention encompasses the equipment for making the prefabricated denture and for fitting the denture to the patient's mouth.



3,567,807
METHOD OF FORMING AND CARBONIZING A COMPOSITE ARTICLE OF INORGANIC PARTICLES BONDED WITH FOAMED PHENOL FORMALDEHYDE RESIN
Richard F. Shannon, Lancaster, Ohio, assignor to Owens-Corning Fiberglas Corporation
Continuation-in-part of application Ser. No. 473,099, July 19, 1965, which is a continuation-in-part of application Ser. No. 107,946, May 5, 1961. This application May 19, 1967, Ser. No. 639,782
Int. Cl. B29c *25/00*
U.S. Cl. 264—29 4 Claims



A method of forming heat insulation material comprising pressing inorganic particles which are surrounded with a foamable phenol-formaldehyde resin into generally abutting contact, foaming the resin; heating in an oxidizing atmosphere of air to a nonkindling temperature between approximately 400° F. and approximately 600° F. for a sufficient period of time to carbonize at least part of the foam.

3,567,808
PRODUCTION OF LOW DENSITY-HIGH STRENGTH CARBON
Mark J. Smith, Emporium, Pa., assignor to Air Reduction Company, Incorporated, New York, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 665,307, Sept. 5, 1967. This application Nov. 18, 1969, Ser. No. 877,846
Int. Cl. C01b *31/02*
U.S. Cl. 264—29 4 Claims

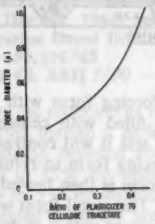
The production of low density, high strength carbon articles using ammonium lignin sulfonate, coconut shell particles, and pitch binders as basic starting materials.

3,567,809

METHOD OF VARYING THE PORE DIAMETERS OF FINE PORES IN CELLULOSE ACETATE FILM

Wataru Ueno and Hideo Kawaguchi, Kanagawa, Japan, assignors to Fuji Shashin Film Kabushiki Kaisha, Kanagawa, Japan

Filed Oct. 6, 1967, Ser. No. 673,404
Claims priority, application Japan, Oct. 7, 1966, 41/66,097
Int. Cl. B29d *27/04*; C08b *21/06, 27/42*
U.S. Cl. 264—41 16 Claims



A method for varying the pore diameter of fine pores in a cellulose acetate film. The film is made by casting a solution containing two cellulose derivatives, each having an acetate linkage, a plasticizer and water, and drying in two stages, first at from 15° to 45° C., and secondly at from 80° to 120° C. Control of pore size is effected by varying type and amount of plasticizer which is a single or a mixture of glycerine derivative, glycol derivative and organic phosphate plasticizers.

3,567,810

PROCESS FOR MAKING HIGH-FLOW ANISOTROPIC MEMBRANES

Richard W. Baker, Cambridge, Mass., assignor to Amicon Corporation, Lexington, Mass.

No Drawing. Filed Apr. 1, 1968, Ser. No. 717,899
Int. Cl. B29d *27/04*
U.S. Cl. 264—41 4 Claims

This invention relates to a novel process for forming improved polymeric anisotropic membranes comprising the additional step of subjecting a cast polymer film suitable for formation of such an anisotropic membrane to an evaporation step prior to precipitation of the membrane, said evaporative step controlled to selectively evaporate solvent from the surface of said film and thereby selectively increase the polymer concentration at the surface of said film. The improved membranes formed by the process of the instant invention are characterized by improved rejection characteristics while retaining liquid flux characteristics which are surprisingly high in view of the rejection characteristics.

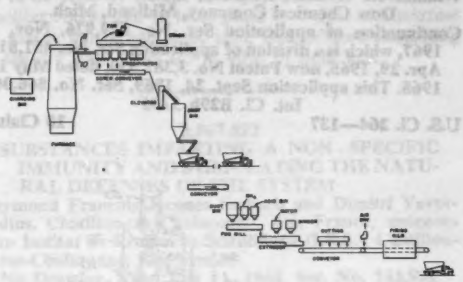
3,567,811

METHOD OF PRODUCING STRONG FIRED COMPACTS FROM IRON OR IRON OXIDE CONTAINING MATERIAL

Clyde W. Humphrey, 1 N. Old State Road, Norwalk, Ohio 44857

Continuation-in-part of application Ser. No. 756,694, May 9, 1968, which is a continuation-in-part of application Ser. No. 443.523, Mar. 29, 1965. This application Oct. 20, 1969, Ser. No. 871,473
Int. Cl. C21b *1/08, 1/10, 1/30*
U.S. Cl. 264—63 16 Claims

Iron or iron oxide fines such as BOF dust, iron ore, and mill scale are formed into strong ceramic bonded compacts suitable as raw material feed for steel making operations, e.g. blast furnace feed. A novel combination of additives, ammonium hydroxide, a mineral acid such as hydrochloric acid, a carbohydrate binder such as molasses, and water, provide the necessary low temperature



strength until a ceramic bond is established. The compacts are formed from the cohesive mass, preferably by extrusion, dried and fired in a conventional manner.

3,567,812

STREAMLINE BALLOON FABRICATION

Moses Sharenow, Asbury Park, and Eric Nelson, Fort Lee, N.J., assignors to the United States of America as represented by the Secretary of the Army

Filed July 8, 1969, Ser. No. 839,827
Int. Cl. B29c *13/04*; B29h *3/02*
U.S. Cl. 264—100 2 Claims

A method of fabricating a streamline balloon that comprises forming a first balloon and laying a partial nonadhering surface thereon. A second balloon is formed on part of the adhering surface of the first balloon. Both balloons are inflated, then deflated and cured. One of the balloons is turned inside-out to provide a tail for desired streamline effect.

3,567,813

PROCESS FOR PREPARING COLOR AND MELT VISCOSITY STABLE POLYCARBONATE RESINS

John J. Keane and John M. Tome, Pittsfield, Mass., assignors to General Electric Company

No Drawing. Filed July 11, 1968, Ser. No. 743,984
Int. Cl. B29f *3/03*; C08g *17/13, 53/20*
U.S. Cl. 264—102 3 Claims

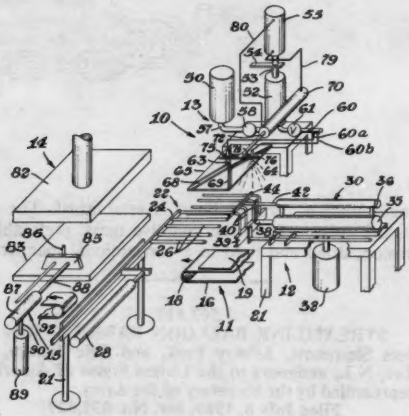
A process for preparing an aromatic carbonate polymer having excellent resistance to thermal discoloration and thermal degradation, which process involves incorporating 0.1–5.0 weight percent of water, based on the weight of the total composition with the aromatic carbonate polymer, and then extruding the mixture through a heated, vacuum vented extruder. A vacuum is applied to the mixture while in the molten state.

3,567,814

METHOD FOR THE PREPARATION OF SHAPED ARTICLES

William K. Glesner, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of application Ser. No. 679,926, Nov. 1, 1967, which is a division of application Ser. No. 451,811, Apr. 29, 1965, now Patent No. 3,382,530, dated May 14, 1968. This application Sept. 24, 1969, Ser. No. 866,062
Int. Cl. B29b 5/06
U.S. Cl. 264—137 10 Claims



Automated matched die molding employing glass fiber preforms is accomplished using a resin dispenser that applies a fixed quantity of resin to each preform in a predetermined pattern which permits distribution of the resin on closing of the press without significant disturbance or dislocation of the reinforcing preform. Uniform high quality moldings are obtained.

3,567,815

RECLAMATION OF LOW DENSITY EXTRUDABLE THERMOPLASTIC MATERIAL

Alan I. W. Frank, Pittsburgh, Pa., assignor to The Alan I. W. Corporation, Pittsburgh, Pa.

No Drawing. Filed Oct. 21, 1968, Ser. No. 769,404
Int. Cl. B29c 29/00; B29f 3/00
U.S. Cl. 264—176 2 Claims

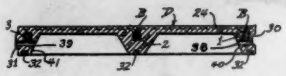
A process of reclaiming low density extrudable thermoplastic material which comprises extruding such material and thereby increasing its density and rendering it suitable for formation of products which are desirably formed with relatively high density extrudable thermoplastic material. The extrudate may be in the form of a sheet, rod, tube, slab or film from which the product may be vacuum formed or otherwise manufactured. Alternatively, the extrudate may be granulated and re-extruded. A quantity of relatively high density extrudable thermoplastic material may be added to the low density extrudable thermoplastic material before extrusion resulting in a significant increase in the extrusion rate and in uniformity of shape of the extrudate. The quantity of relatively high density extrudable thermoplastic material which is added to the low density extrudable thermoplastic material may be equal to between about five and about thirty percent by volume of the quantity of low density extrudable thermoplastic material. The bulk density of the low density extrudable thermoplastic material may be of the order of one-half to fifteen pounds per cubic foot and the bulk density of the relatively high density extrudable thermoplastic material may be of the order of fifteen to fifty pounds per cubic foot.

3,567,816

METHOD OF PRETENSIONING AND REINFORCING A CONCRETE CASTING

Earl P. Embree, 1493 Gardner Blvd., San Leandro, Calif. 94577

Filed Apr. 10, 1969, Ser. No. 814,989
Int. Cl. B28b 19/00; E04c 3/10
U.S. Cl. 264—228 2 Claims



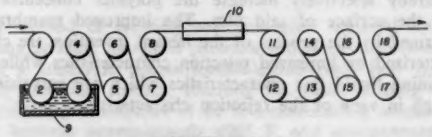
A hollow reinforcing form with projections on its exterior surface, is filled with cement under pressure but when the cement sets it will contract and permit the hollow metal reinforcing form to return to normal position. The reinforcing form is then heated to about 150° F. and placed in a mold. The metal form will expand to a greater extent than the cement within it due to the heating. Concrete is poured around the reinforcing form and fills the mold so as to embed the reinforcing form. If necessary the mold can be vibrated for causing all voids in the mold to be filled with concrete. When the concrete sets, the reinforced concrete casting is removed from the mold and the hollow reinforcing material with the cement therewithin will return to ambient temperature. The hollow reinforcing material will tend to contract to a greater extent than the cement within it. The contracting form through its projections will tend to compress the concrete and will thus pretension the concrete casting. The cement in the hollow reinforcing material will add greater strength to the form and material.

3,567,817

POLYESTER TOW PREHEATING AND DRAWING PROCESS

Herbert A. Spiller, Decatur, Ala., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of application Ser. No. 734,632, June 5, 1968, which is a continuation-in-part of application Ser. No. 434,438, Feb. 23, 1965. This application May 19, 1969, Ser. No. 825,541
Int. Cl. D02j 1/22
U.S. Cl. 264—290 1 Claim



In a high speed continuous drawing process where polyester tows are preconditioned for drawing at speeds of greater than about 50 yards per minute, unoriented polyester tow is subjected to a first inert bath maintained at higher than the optimum pre-draw temperature; exposed to a cooling medium lower than the optimum pre-draw temperature, whereby the uniform optimum pre-draw temperature is obtained throughout the thickness of the tow, after which the tow is subjected to temperatures higher than that of the optimum pre-draw temperature while being drawn at least 2×. The first inert bath is maintained at 75–100° C. and dwell time is 0.2–5.0 seconds. The cooling medium is maintained at 40–60° C. and exposure time is 5–40 seconds. The optimum pre-

draw temperature achieved is about 62° C. This processing results in improved tenacity, elongation and/or modulus of the tow.

3,567,818
PELLETS FOR SUPPLYING COPPER TO RUMINANTS
Reginald Gordon Hemingway, Bearsden, and Norman S. Ritchie, Glasgow, Scotland, assignors to The University Court of the University of Glasgow, Glasgow, Scotland
No Drawing. Filed Dec. 12, 1966, Ser. No. 600,746
Claims priority, application Great Britain, Dec. 17, 1965, 53,316/65
Int. Cl. A61j *3/00*
U.S. Cl. 424—14 12 Claims

Copper necessary for the nutrition of ruminants may be supplied by administering thereto a pallet or bullet comprising an alloy containing between 40% and 70% by weight copper, from 0 to 15% by weight of aluminium and a total of from 0 to 5% by weight of one or more of a trace element selected from the group consisting of cobalt, zinc and manganese, the balance being magnesium. It has also been found that the rate of release of copper from the pellet in the ruminal juices can be controlled by varying the proportion of aluminium.

3,567,819
COLD TABLET
Bernard Idson, Leonia, and Michael Stanley Weiss, Paramus, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.
No Drawing. Filed Jan. 30, 1969, Ser. No. 795,351
Int. Cl. A61j *3/10;* A61k *9/00, 27/12*
U.S. Cl. 424—16 4 Claims

Pleasantly flavored, chewable tablets containing aspirin and a decongestant are provided.

3,567,820
COMPOSITIONS AND TREATMENT FOR THE ALLEVIATION OF DIAPER RASH
George S. Sperti, 1842 Madison Road, Cincinnati, Ohio 45206
No Drawing. Continuation-in-part of application Ser. No. 523,542, Jan. 25, 1966. This application Apr. 9, 1969, Ser. No. 814,835
Int. Cl. A61k *15/02*
U.S. Cl. 424—79 8 Claims

A method and composition for the prevention and alleviation of diaper rash whereby the skin is treated with a composition consisting essentially of a vehicle, a respiration stimulating factor, a cellular proliferation factor and a quantity of dispersed, finely divided cation exchange resin capable of absorbing ammonia and ammonium irritants.

3,567,821
MEDICAMENT FOR THE AFFECTIONS OF MUCOUS MEMBRANES
Lucien Nouvel, 91 Avenue des Ternes, Paris 17, France
No Drawing. Continuation of application Ser. No. 410,758, Nov. 12, 1964. This application May 23, 1968, Ser. No. 732,497
Claims priority, application France, Nov. 13, 1963, 953,570; May 14, 1964, 974,500
The portion of the term of the patent subsequent to Feb. 20, 1985, has been disclaimed
Int. Cl. A61k *17/00*
U.S. Cl. 424—93 10 Claims

1. Medicament for the affection of mucous membranes constituted gastric mucin and sialic acid in an amount sufficient to provide 0.5 to 40% by weight of N-acetylneuraminic acid on a dry basis.

2. Medicament as claimed in claim 1 which comprises 20 to 60 parts by weight of a lyophilisate of a culture of *Bacillus bifidus* and 10 to 35 parts by weight of a mixture of gastric mucin and sialic acid, said mixture containing in the dry state, from 0.5 to 40% of sialic acid.

3,567,822
SUBSTANCES IMPARTING A NON-SPECIFIC IMMUNITY AND STIMULATING THE NATURAL DEFENSES OF THE SYSTEM
Raymond Francois Jacques Sarbach and Dimitri Yavordios, Chatillon-sur-Chalaronne, Ain, France, assignors to Institut de Recherche Scientifique (I.R.S.), Chatillon-sur-Chalaronne, Ain, France
No Drawing. Filed July 11, 1968, Ser. No. 743,962
Claims priority, application France, July 12, 1967, 114,081
Int. Cl. A61k *27/00*
U.S. Cl. 424—92 3 Claims

Substances imparting a non-specific immunity and stimulating the natural defenses of the system obtained in a soluble state from a *Neisseria perflava* germ by the action of amino-acids entailing the lytic conversion of living microbial bodies.

3,567,823
SILVER AMMONIA FLUORIDE SOLUTION AND METHOD OF ITS USE
Reiichi Yamaga, 1–15, Tondayanagawa-cho, Takatsuki-shi, Osaka-fu, Japan, and Ichiro Yokomizo, 45, Shitikukami-honmachi, Kita-ku, Kyoto-shi, Kyoto-fu, Japan
Filed June 5, 1968, Ser. No. 734,668
Claims priority, application Japan, June 9, 1967, 42/36,864
Int. Cl. A61k *5/00*
U.S. Cl. 424—132 9 Claims

A stable aqueous solution of silver ammonia fluoride which is prepared by dissolving silver fluoride in an aqueous ammonia or introducing gaseous ammonia into an aqueous solution of silver fluoride and adjusting the solution to pH 6.5~9.5. The silver ammonia fluoride solution can be effectively stabilized by addition of 1~2 w./v. percent of ammonium fluoride. The thus prepared solution is useful for prevention of dental diseases including caries and hypersensitivity. There is also disclosed a mouthpiece which comprises a horseshoe shaped body made of a spongy material saturated with a silver ammonia fluoride solution and a coating made of a water-impermeable material which covers the outer perimeter except for the surface being brought in contact with the affected part.

3,567,824
NON-SLUDGING DIMETHYL - 1,2-DIBROMO-2,2-DICHLOROETHYL PHOSPHATE-FUEL OIL COMPOSITIONS
Joseph E. Moore, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.
No Drawing. Filed Feb. 15, 1965, Ser. No. 432,868
Int. Cl. A01n *9/00;* C10l *1/26*
U.S. Cl. 424—225 3 Claims

Pesticidal compositions comprising dimethyl-1,2-dibromo-2,2-dichloroethyl phosphate, fuel oil and a salt of the reaction product obtained by reacting at a temperature between 300–415° F. an aliphatic monocarboxylic acid having between 14–18 carbon atoms with a polyalkylene polyamine having one more nitrogen atom per molecule than there are alkylene groups in the molecule, in a molar proportion of acid to amine varying between about 1:1 and X:1, X representing the number of nitrogen atoms in the polyalkylene polyamine reactant. The salt inhibits sludge formation in the composition.

3,567,825

ANTIMICROBIAL PREPARATIONS

Herbert Klesper, Cologne-Flittard, Fritz Steinfatt, Opladen, Klaus Langheinrich, Leverkusen, and Walter Lorenz, Wuppertal-Vohwinkel, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Nov. 15, 1965, Ser. No. 507,672

Claims priority, application Germany, Nov. 20, 1964, F 44,483

Int. Cl. A01n *9/26*

U.S. Cl. 424—230 4 Claims

Antimicrobial preparations based on reaction products of an amide and paraformaldehyde.

3,567,826

THERAPEUTIC COMPOSITION CONTAINING 2-AMINO-OXAZOLIN-4-ONE DERIVATIVES

Jan Marcel Didier Aron-Samuel, 118 Rue Carnot, 92 Suresnes, Hauts-de-Seine, France

No Drawing. Filed May 2, 1966, Ser. No. 546,542

Claims priority, application Great Britain, May 10, 1965, 19,674/65

Int. Cl. A61u *27/00*

U.S. Cl. 424—250 7 Claims

A therapeutic composition for the treatment of patients requiring an anti-inflammatory, anti-pyretic or analgesic agent comprises a pharmaceutically acceptable carrier and from about 5 mg. to about 1 g. of a derivative of 2-amino-oxazolin-4-one in which the substituent in the 5-position may be alkyl of 1–14 carbon atoms, phenyl, halophenyl, lower alkoxyphenyl or methylene-dioxyphenyl, the amino nitrogen being a part of a piperidine, pyrrolidine, morpholine or piperazine ring, which ring may also contain a C-lower alkyl or C-di-lower alkyl substituent, and when the ring is piperazine, there may be substituted on the second nitrogen atom thereof an alkyl, hydroxyalkyl, N-dialkylaminoalkyl, phenyl, halophenyl, alkylphenyl, alkoxyphenyl, benzyl, alkanoyl, benzoyl, halobenzoylalkyl, or trialkoxybenzoyl group.

3,567,827

METHOD OF CONTROLLING FLIES UTILIZING 2,3-DIHYDRO-2-PHENYL-4(1H)-QUINAZOLINONE

Barbara Stearns, Highland Park, N.J., assignor to E. R. Squibb & Sons, Inc., New York, N.Y.

No Drawing. Filed June 3, 1968, Ser. No. 733,823

Int. Cl. A01n *9/22*

U.S. Cl. 424—251 3 Claims

Insects are controlled by contacting the insect with insecticidal amounts of 2,3-dihydro-2-phenyl-4(1H)-quinazolinone, and salts thereof.

3,567,828

ORGANIC COMPOUNDS

Edward Fluckiger, Binningen, Switzerland, assignor to Sandoz Ltd. (also known as Sandoz AG), Basel, Switzerland

No Drawing. Filed Aug. 12, 1968, Ser. No. 751,751

Claims priority, application Switzerland, Aug. 17, 1967, 11,603/67

Int. Cl. A61h *27/00*

U.S. Cl. 424—261 6 Claims

The invention provides a pharmaceutical composition incorporating (a) a reserpine constituent, (b) a dihydroergocristine constituent, and (c) N-(cis-2,6-dimethylpiperidino)-4-chloro-3-sulphamoyl benzamide.

The composition produces a pronounced blood pressure lowering effect and is therefore useful in the treatment of high blood pressure illnesses.

3,567,829

COMPOSITION AND METHOD FOR CONTROLLING INFLUENZA A_2 VIRUS INFECTIONS WITH 2-AZA-ADAMANTANE

Andre R. Gagneux, Basel, Switzerland, assignor to Geigy Chemical Corporation, Ardsley, N.Y.

No Drawing. Filed Oct. 7, 1968, Ser. No. 765,650

Claims priority, application Switzerland, Oct. 13, 1967, 14,366/67

Int. Cl. A61k *27/00*

U.S. Cl. 424—267 3 Claims

2-aza-adamantane possesses anti-influenza A_2 viral properties. Pharmaceutical compositions comprising this compound and the use thereof are provided.

3,567,830

COMPOSITIONS AND METHODS FOR PRODUCING A SEDATIVE AND DEPRESSANT EFFECT IN A MAMMAL WITH AN AZASPIROALKYL-BUTYROPHENONE

Rolf Denss and Hugo Ryf, Basel, and Daniel Prins, Oberwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 734,182, Mar. 11, 1968, which is a division of application Ser. No. 565,753, July 18, 1966, now Patent No. 3,424,755, which in turn is a continuation-in-part of application Ser. No. 438,047, Mar. 8, 1965. This application Oct. 16, 1968, Ser. No. 768,178

Claims priority, application Switzerland, Mar. 10, 1964, 2,994/64; July 26, 1965, 10,444/65; June 15, 1966, 8,670/66

Int. Cl. A61k *27/00*

U.S. Cl. 424—267 8 Claims

Therapeutic compositions containing an azaspiro-alkylbutyrophenone or a pharmaceutically acceptable acid addition salt thereof, exhibit sedative and depressant actions on the central nervous system. Illustrative embodiments and to compositions useful for this purpose. More fluorobutyrophenone and 4-(3-phenyl-1,5-dioxa-9-azaspiro[5.5]undec-9-yl)-4'-fluorobutyrophenone.

3,567,831

PHARMACEUTICAL COMPOSITIONS CONTAINING 2,2,5,5-TETRAKIS(POLYFLUOROMETHYL) IMIDAZOLIDINES AND IMIDAZOLINES AND METHODS OF USING SUCH

William J. Middleton, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Division of application Ser. No. 521,317, Feb. 9, 1966, now Patent No. 3,459,766, which is a continuation-in-part of application Ser. No. 461,151, June 3, 1965, which in turn is a continuation-in-part of application Ser. No. 439,476, Mar. 12, 1965. This application Apr. 17, 1969, Ser. No. 817,201

Int. Cl. A61k *27/00*

U.S. Cl. 424—273 18 Claims

Described and claimed are pharmaceutical compositions containing psychotropic or muscle-relaxant 2,2,5,5-tetrakis(polyfluoromethyl)imidazodilines and imidazolines of my copending Ser. No. 521,317, and the use of the pharmaceutical compositions.

3,567,832

NEW HYPOTENSIVE AND ODDIAN SPASMOLYTIC PHARMACEUTICAL METHODS EMPLOYING VARIOUS HYDROXY COUMARINES

Eugène Boschetti, Venissieux, Darius Molho, Boulogne-sur-Seine, and Louis Fontaine, Lyon, France, assignors to LIPHA, Lyonnaise Industrielle Pharmaceutique

No Drawing. Filed Mar. 18, 1968, Ser. No. 714,043

Claims priority, application France, Nov. 20, 1967, 128,850

Int. Cl. A61k *27/00*

U.S. Cl. 424—281 3 Claims

A new hypotensive and oddian spasmolytic pharmaceutical composition, containing as active principle a hydroxycoumarine selected from the group consisting of 8-hydroxycoumarine, 7,8 dihydroxycoumarine, 4,5,7-trihydroxycoumarine, 4,6,7-trihydroxycoumarine, 4,7,8-trihydroxycoumarine, 7-hydroxycoumarine, 3 - carboxy-7,8-dihydroxycoumarine, 3 - methyl - 4,7,8 - trihydroxycoumarine, 3-phenyl-4,5,7-trihydroxycoumarine, 3-chloro-4-methyl-7,8-dihydroxycoumarine, 3 - chloro-4-methyl-5,7-dihydroxycoumarine, 3-chloro-4-methyl - 6,7 - dihydroxycoumarine, 3-amino-7,8-dihydroxycoumarine.

3,567,833

POLYCYCLIC POLYHALOGENATED PESTICIDES

Edward D. Weil, Apt. 8B, 495 Odell Ave., Yonkers, N.Y. 10710, and Paul E. Hoch, 455 Church St., Youngstown, N.Y. 14174

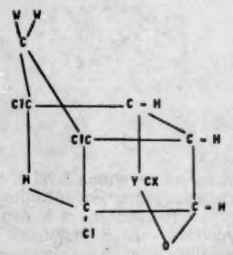
No Drawing. Division of application Ser. No. 551,246, May 19, 1966, now Patent No. 3,494,938, which is a continuation-in-part of applications Ser. No. 325,519, Dec. 2, 1963, now Patent No. 3,331,860, and Ser. No. 510,072, Nov. 26, 1965, now Patent No. 3,322,622.

This application Jan. 7, 1969, Ser. No. 812,505

Int. Cl. A01n *9/28*

U.S. Cl. 424—285 7 Claims

A method for the control of pests is described comprising applying to the locus of said pests, a pesticidally effective amount of the compound of the formula



wherein X and Y are independently selected from the group consisting of chlorine and hydrogen, M is selected from the group consisting of carbonyl and hydroxymethylene, and W independently is selected from the group consisting of bromine, fluorine, chlorine, alkyl bromides, fluorides, and chlorides wherein the alkyl group consists of 1 to 5 carbon atoms, and alkyl groups of 1 to 5 carbons, wherein at least one of the W's is halogen.

3,567,834

METHOD OF PRODUCING SEDATION

Edmund Stanley Granatek and Alphonse Peter Granatek, Baldwinsville, N.Y., assignors to Bristol-Myers Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 605,156, Dec. 28, 1966. This application June 16, 1969, Ser. No. 833,739

Int. Cl. A61k *27/00*

U.S. Cl. 424—311 5 Claims

2,2,2-tribromoethyl glycinate and 2,2,2-trichloroethyl glycinate, and the pharmaceutically acceptable salts thereof, are compounds possessing sedative-narcosis activity in mammals.

The compounds of the invention, particularly the 2,2,2-trichloroethyl glycinate hydrochloride, have been found to be as effective as chloral hydrate in producing sedation when administered on a molar equivalent dosage basis to mammals.

3,567,835

MUCOLYTIC SALTS, COMPOSITIONS AND PROCESS FOR TREATING MUCUS

Henri Morren, Forest, Belgium, assignor to UCB (Union Chimique Chemische Bedrijven), S.A., Saint-Gilles-les-Brussels, Belgium

No Drawing. Original application May 2, 1966, Ser. No. 546,592. Divided and this application Dec. 13, 1968, Ser. No. 807,147

Claims priority, application Great Britain, May 7, 1965, 19,370/65

Int. Cl. A61u *27/00*

U.S. Cl. 424—315 5 Claims

Mucolytic compositions, especially effective for fluidifying mucus in humans, comprising a mucolytically effective amount of a salt and/or mixture of salts of a mercapto-alkane-sulfonic acid of the formula $HS—X—SO_3H$, wherein X is an alkylene radical having 2–6 carbon atoms and at least one non-toxic pharmaceutically effective carrier.

3,567,836

FLUORINE CONTAINING ETHYL DISULFIDE FUNGICIDES

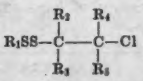
Don R. Baker and Harry A. Pacini, Pinole, and Thomas B. Williamson, Santa Clara, Calif., assignors to Stauffer Chemical Company, New York, N.Y.

No Drawing. Division of application Ser. No. 606,545, Jan. 3, 1967, now Patent No. 3,474,146, dated Oct. 21, 1969. Continuation-in-part of application Ser. No. 520,091, Jan. 12, 1966, which is a continuation of application Ser. No. 351,533, Mar. 12, 1964. This application June 4, 1969, Ser. No. 841,178

Int. Cl. A01n *9/12*

U.S. Cl. 424—336 11 Claims

Fluorine-containing ethyl organic disulfides of the formula



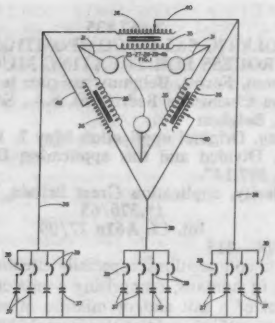
wherein R_1 can be an alkyl having from 1 to 8 carbon atoms, cyclohexyl, lower alkenyl, phenyl, halophenyl, lower alkyl phenyl wherein said lower alkyl portion contains 1 to 4 carbon atoms, phenalkyl, wherein said alkyl portion contains 1 to 4 carbon atoms, and naphthyl; R_2, R_3, R_4 and R_5 can be hydrogen, fluorine, and chlorine, at least two of said R_2, R_3, R_4 and R_5 are fluorine or chlorine of which at least one is a fluorine atom; for example, 2,2-difluoro-2-chloroethyl n-butyl disulfide, 1,1-difluoro-2-chloroethyl n-butyl disulfide, 2,2-difluoro-1,1,2-trichloroethyl benzyl disulfide, and 1-fluoro-1,2,2,2-tetrachloroethyl phenethyl disulfide. Extremely effective for controlling and inhibiting the growth of fungi such as *Aspergillus niger* and *Penicillium sp.*, and controlling the acarid, two-spotted mite, *Tetranychus telarius* (Linn.).

ELECTRICAL

3,567,837
ELECTRIC FURNACE FOR ARC MELTING

Jack A. Van Nostran, and Otis D. Jordan, North Canton, Ohio, assignors to Ohio Ferro-Alloys Corporation, Canton, Ohio

Original application Dec. 3, 1968, Ser. No. 780,668. Divided and this application Nov. 19, 1969, Ser. No. 877,985
Int. Cl. H05b *7/18*
U.S. Cl. 13—12 **4 Claims**



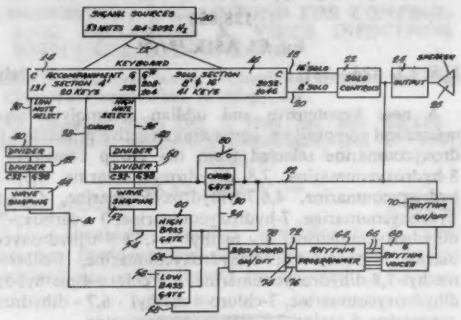
An electric furnace for arc melting having electrodes connected to a main source of electrical power. A transformer having high voltage windings and low voltage windings is provided. There is means for independently connecting the electrodes to the low voltage windings of said transformer, and means for connecting the high voltage windings of the transformer to power factor correctional devices. The transformer is a three phase transformer and there are a plurality of power factor correctional devices connected to the high voltage winding of each phase of the transformer. The power factor correctional devices are preferably capacitors. Circuit breakers are provided for connecting the capacitors to the high voltage windings and disconnecting them therefrom and for changing the amount of capacitance connected to the high voltage windings.

3,567,838
MUSICAL INSTRUMENT RHYTHM SYSTEM HAVING PROVISION FOR INTRODUCING AUTOMATICALLY SELECTED CHORD COMPONENTS

Charles J. Tennes, Palatine, and Donald R. Kern, Buffalo Grove, Ill., assignors to Hammond Corporation, Deerfield, Ill.

Filed Nov. 12, 1969, Ser. No. 875,915
Int. Cl. G10h *1/00*; G10f *1/00*
U.S. Cl. 84—1.01 **11 Claims**

An organ rhythm system of the automatic programmed type which at the various beats in a measure or between beats can give automatically the chord being played and/or the root and the fifth of the chord as bass notes, or a musically acceptable substitute intermixed as desired with selected noise type sounds present simultaneously or as other beats. The root and fifth bass notes or the equivalents for this purpose are obtained respectively by frequency division and wave shaping of signals obtained from a low note select and a high note select preference circuit operating over the compass of the accompaniment section of the instrument. Other

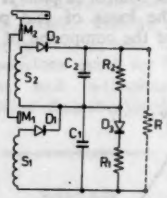


automatic musical responses are also available from the high and low note select preference circuits and the chord circuit.

3,567,839
PERCUSSIVE ELECTRONIC MUSICAL INSTRUMENT WITH OUTPUT LEVEL CONTROLLED BY INTENSITY OF KEY DEPRESSION

Popko Reinder Dijksterhuis, Deceased, Late of Bilthoven, and Casper Antonius Henricus Mulkens, Administrator, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 12, 1968, Ser. No. 759,532
Claims priority, application Netherlands, Sept. 15, 1967, 6712682
Int. Cl. G10h *1/02*
U.S. Cl. 84—1.26 **5 Claims**



A unit for controlling the output level of a tone generator of an electronic musical instrument according to the intensity with which a key of the instrument is depressed. A diode used in its nonlinear range is employed in the unit for graduating a normally abrupt change between time constants of the output waveform of the unit.

3,567,840
TAPE DRIVE MECHANISM FOR ELECTRICAL MUSICAL INSTRUMENTS

Harry C. Chamberlin, 354 Winn Drive, Upland, Calif.

Filed June 20, 1968, Ser. No. 738,495
Int. Cl. G10h *3/06, 3/04*
U.S. Cl. 84—1.28 **12 Claims**

A record tape drive mechanism for electrical musical instruments in which the tape is movable in opposite directions

over a sound pickup, the tape having one end anchored on one side of the pickup, and its other end connected with a tape winding element on the outer side of the pickup and which is continuously driven by power means through a friction driving connection to wind up the tape to a start position as determined by the tape anchor. Also, on said one side there are normally ineffective power driven means for over-

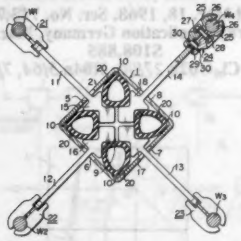
riding a friction driving force and moving the tape in an unwinding direction from the winding element and away from the start position for reproducing the recorded sound Manually actuated control means includes a manually movable key operable for effecting operation of the tape moving means for reproduction of sound from the record tape, and upon release permits rewind to its start position.

3,567,841

DAMPER SPACER FOR USE WITH BUNDLE CONDUCTORS

Masashi Kobayshi, Kawasaki, Japan, assignor to Asabi Denki Kabrishiki Kaisha, Kawasaki, Japan

Filed Oct. 29, 1969, Ser. No. 872,116
Int. Cl. H02g *7/14, 7/12*
U.S. Cl. 174—42 **2 Claims**



A damper spacer for use with bundle conductors comprises a hollow box-shaped main body and as many arm members as conductors. Each of the arm members, fixing at its outer end a conductor grasping member rigidly mounting a conductor, is introduced into the box-shaped main body at its inner end so that between the outer surface of the inner end of the respective arm members and the inner surface of the boxlike main body there is provided a space having any desired configuration into which space is disposed an elastic body so that the respective arm member is held elastically with respect to the main body.

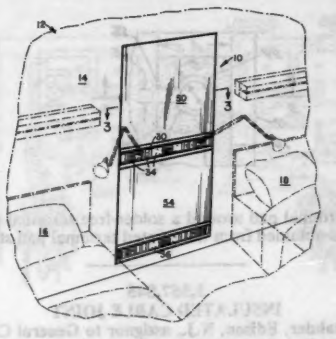
3,567,842

WALL STRUCTURE

Ronald K. Meyer, 171 Minna St., San Francisco, Calif. 94105

Filed Sept. 5, 1968, Ser. No. 757,614
Int. Cl. H02g *3/10*
U.S. Cl. 174—48 **4 Claims**

A wall structure adapted to be built into a wall, the wall having service conduits passing therewithin, having a framework made up of a pair of horizontal members and a pair of vertical members, and a console having a plurality of outlets therein, the console being mounted to the framework,



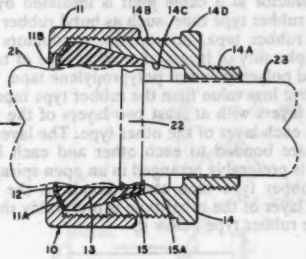
and the outlets being connected to the service conduits, whereby they become service outlets.

3,567,843

ELECTRICAL CONNECTOR FOR WATERPROOF JACKETED ARMORED CABLE

Kenneth M. Collins, Markham, Ontario, and John B. Davis, Oakville, Ontario, Canada, assignors to Grouse - Hinds Company, Syracuse, N.Y.

Filed Nov. 6, 1968, Ser. No. 773,823
Int. Cl. H01r *3/04;* **H02g** *3/18*
U.S. Cl. 174—51 **3 Claims**



An electrical connector for attaching an armored cable having an exterior waterproof jacket to a junction box, such that the cable is rigidly mechanically gripped by the connector, is electrically grounded thereto, and is sealed therein in a watertight seal, consists of a resilient grommet surrounding the cable jacket and compressed between two threaded members to provide a watertight seal and mechanical gripping, and a plurality of metallic stirrups straddling the inner and outer surfaces of the grommet at one end thereof to coact both with an exposed portion of the metallic armor of the cable and the metal of the connector to provide electrical grounding and additional mechanical gripping of the cable, the connector being further provided with an additional threaded portion for attachment to the junction box.

3,567,844

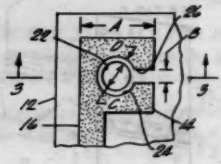
TERMINAL PAD FOR PERFORATED CIRCUIT BOARDS AND SUBSTRATES

Ludwig L. Krcmar, Simi, Calif., assignor to McDonnell Douglas Corporation

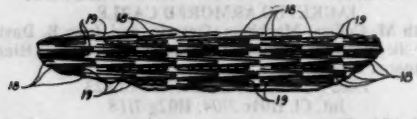
Filed June 23, 1969, Ser. No. 835,567
Int. Cl. H05k *3/32*
U.S. Cl. 174—68.5 **6 Claims**

Printed terminal pad structure is formed on a circuit board or substrate surface around and adjacent to the periphery of a terminal pin opening, the pad structure being characterized by a radially extending slot of appropriate width therein to prevent the pin opening from being plugged during a sub-

sequent dip soldering process when a coating of solder is applied to the exposed surface of the pad structure. A solder-coated terminal pad around a solder-free terminal pin opening is thus obtained from the printed terminal pad structure.



3,567,845
INSULATED CABLE JOINT
George Bahder, Edison, N.J., assignor to General Cable Corporation, New York, N.Y.
Filed Jan. 16, 1970, Ser. No. 003,448
Int. Cl. H01b *7/02;* **H02g** *15/08*
U.S. Cl. 174—84 **12 Claims**

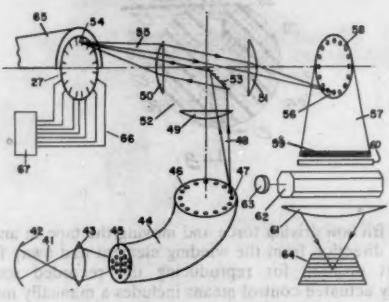


The conductor at a cable joint is insulated by successive layers of a rubber type tape, such as butyl rubber or ethylene propylene rubber tape, around the conductors and incorporating a plurality of layers of another type of tape, such as cross-linked polyethylene or polypropylene tape, which has a lower electric loss value than the rubber type tape, in successive single layers with at least two layers of the rubber type tape under each layer of the other type. The layers of rubber type tape are bonded to each other and each layer of the other type is preferably arranged in an open spiral so that the layer of rubber type tape above bonds to the one below. Also, each layer of the other type is preferably shrunk on the layer of the rubber type below it.

3,567,846
METALLIC SHEATHED CABLES WITH ROAM CELLULAR POLYOLEFIN INSULATION AND METHOD OF MAKING
William J. Brorein, Whippany, and Fred F. Polizzano, Allendale, N.J., assignors to General Cable Corporation, New York, N.Y.
Filed May 31, 1968, Ser. No. 733,528
Int. Cl. H01b *7/18*
U.S. Cl. 174—102 **9 Claims**

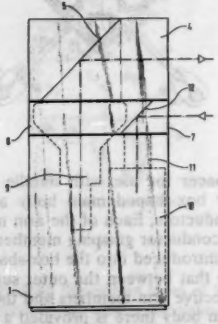
The metallic sheathed electrical cables of this invention have foamed cellular polyolefin dielectric insulation which is fusion-bonded to the inside of an annealed sheath to obtain better electrical and mechanical characteristics. The sheath is applied to a foam-insulated core and then sunk down by drawing through a die or reducing rolls to make the tube fit the insulated core snugly. Controlled heating of the sheathing melts the part of the insulation, or adhesive material, when used, which is in contact with the sheath to produce the fusion bond. The heating period is short and is followed by a quench. This controlled heating and cooling is also used to anneal the metallic sheath.

3,567,847
ELECTRO-OPTICAL DISPLAY SYSTEM
Edgar E. Price, 648 Applegrove Circle, Webster, N.Y.
Filed Jan. 6, 1969, Ser. No. 789,317
Int. Cl. H04n *9/14, 5/74*
U.S. Cl. 178—5.4 **12 Claims**



An electro-optical display system particularly for projecting an enlarged color television image on a screen in which the transmitted signals are converted into points of light modulated by a Fabry-Perot multiple interferometric light modulator assembly.

3,567,848
TELEPHONE-TELEVISION EQUIPMENT
Paul Hans Thies, Munich, and Rainer Bergmann, Dortmund, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany
Filed Mar. 18, 1968, Ser. No. 713,773
Claims priority, application Germany, Mar. 17, 1967, S108,885
Int. Cl. G02b *27/00;* **H04n** *5/64, 7/06*
U.S. Cl. 178—6 **16 Claims**

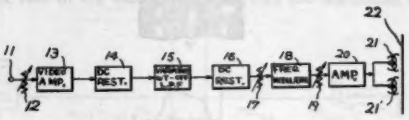


Apparatus for use in conjunction with telephone-television equipment wherein subscribers may simultaneously communicate acoustically and visually. At each subscriber station, the television camera is arranged in relation to the television receiver such that the user must be positioned within viewing range of the television camera to observe the image reproduced by the television receiver. This insures automatic transmission of a television signal to the associated connected subscriber which represents the image of the user.

3,567,849
VARIABLE BANDWIDTH MAGNETIC RECORDING SYSTEM

Kenjiro Takayanagi; Tomiyuki Tanaka, and Yoshihiko Ota, Tokyo, Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Oct. 30, 1967, Ser. No. 678,857
Claims priority, application Japan, Oct. 29, 1966, 41/71,226
Int. Cl. H04n 1/28, 5/78, 7/12
U.S. Cl. 178—6.6 5 Claims

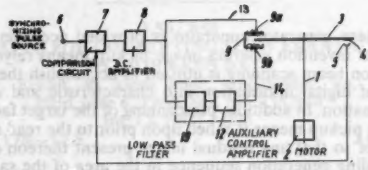


A variable bandwidth magnetic recording system records a modulated carrier wave which is frequency-modulated by a video signal that is to be transmitted. The transmitted frequency band can be varied in accordance with the instantaneous value of the voltage or voltages of the low frequency component of the video signal, which include a mean brightness in a horizontal scanning period or in a vertical scanning field. When the instantaneous value voltage or voltages are high, the width of the transmitted frequency band is increased. When the instantaneous value voltage or voltages are low, the width of the transmitted frequency band is reduced.

3,567,850
ARRANGEMENT FOR PHASE-CORRECT REGULATION OF THE SPEED OF A ROTATING SHAFT

Fritz Habel, Berlin, Germany, assignor to Telefunken Patentverwertungsgesellschaft m.b.H., Ulm Danube, Germany

Filed Feb. 7, 1969, Ser. No. 797,648
Claims priority, application Germany, Feb. 8, 1968, P 16 38 155.8
Int. Cl. H04m 5/76; H02k 7/104
U.S. Cl. 178—6.6 9 Claims



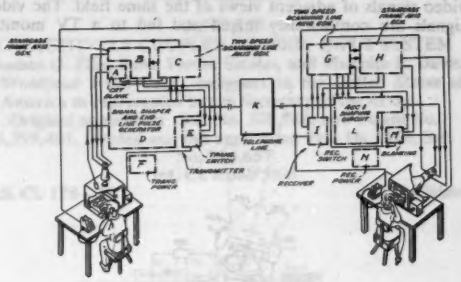
An arrangement for improved regulation of the phase position of a rotating shaft includes an auxiliary circuit branch connected in parallel with the current path of a control signal, which auxiliary branch consists of a filter member and an auxiliary control amplifier, the arrangement being provided so that phase deviations of the control signal, which last for an extended period of time, as they might appear during changes of the synchronizing pulse frequency or of the mechanical friction conditions, become effective as an additional control value for the compensation of these changes.

3,567,851
ELECTRONIC SYSTEM FOR FAST TRANSMISSION OF TWO TONALITIES FIXED IMAGES

Aurelio Beltrami, Via Circo 4, Milan, Italy

Filed Apr. 24, 1967, Ser. No. 633,190
Claims priority, application Italy, Aug. 6, 1966, 21,177
Int. Cl. H04n 7/12
U.S. Cl. 178—6.8 5 Claims

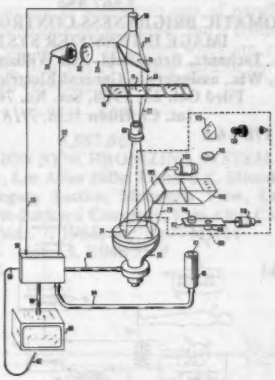
An electronic system for fast transmission of two tonalities fixed images, through telephone plants wherein there is transmitted only a pulse corresponding to the points where there is a variation of tonality and to the points corresponding to the starting of the end line pulses. At the reception end, the image is reconstructed on a picture tube, by means of a raster having a two speed line axis and a staircase frame axis.



3,567,852
FILM DISPLAY SYSTEM

Allen H. Ett, Bethesda, Md., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 1, 1968, Ser. No. 764,136
Int. Cl. H04n 5/36, 7/18
U.S. Cl. 178—6.8 6 Claims



An information retrieval system for reading and displaying information contained on a photographic film, in which the combination of the reading and displaying functions is accomplished by using multiplexing techniques. A single light path transmits light in two directions to achieve perfect registration between the information read from the film and the information displayed from the film.

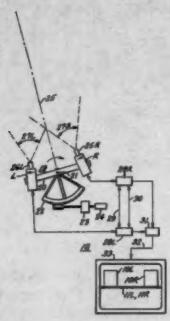
3,567,853
TELEVISION POSITION INDICATING APPARATUS

Leonard E. Green, Dundalk, Md., assignor to Bethlehem Steel Corporation

Filed Feb. 27, 1969, Ser. No. 802,834
Int. Cl. H04n 7/18
U.S. Cl. 178—6.8 3 Claims

Closed circuit TV indicates the alignment position of a coil lifter on a remotely controlled subway car with the vertical center of a coil of metal strip located randomly along skids on a floor above the car. Two vidicon TV cameras, one

modified for opposite-hand horizontal scanning, are attached to a remotely controlled azimuthal aiming mount and imaged from opposite side of an aiming axis which extends perpendicular to car movement. This produces two opposite-hand video signals of adjacent views of the same field. The video signals are continuously mixed and fed to a TV monitor



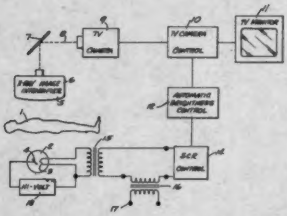
where full opposite-hand images are observed in superposed relationship. Two horizontally displaced images of the coil, or an illuminated target carried by the subway car at the lifter, converge toward one another during movement of the aiming mount or the car, whereby said alignment is indicated by maximum convergence of their TV images.

3,567,854

AUTOMATIC BRIGHTNESS CONTROL FOR X-RAY IMAGE INTENSIFIER SYSTEM

Leslie G. Tschantz, Brookfield, and William H. Wesbey, New Berlin, Wis., assignors to General Electric Company

Filed Oct. 23, 1968, Ser. No. 769,963
Int. Cl. H04n *1/38, 7/18*
U.S. Cl. 178—6.8 **6 Claims**



The visual image in x-ray image intensifier is viewed with a TV camera and displayed on a monitor. Constant picture brightness is maintained regardless of x-ray transparency differences in various regions of the subject by peak detecting the video signals corresponding with a specific picture region and using the signals in a closed-loop system to control the x-ray tube current and, hence, the intensity of the x-ray through the subject.

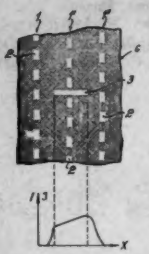
3,567,855

SCANNING APPARATUS WITH AUTOMATIC BEAM CENTERING

Hansjoachim Hamisch, Berlin, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 3, 1969, Ser. No. 803,858
Claims priority, application Germany, Mar. 1, 1968, 1,613,990
Int. Cl. H04n *5/82;* **G05b** *1/06;* **G11b** *7/00*
U.S. Cl. 178—7.1 **14 Claims**

An elongated focal light spot whose intensity gradually varies along its length, crosses a track of a record carrier having light permeable recordings and scans the same. When the record carrier is undesirably displaced, signals whose intensity varies pass through the light permeable recordings and are



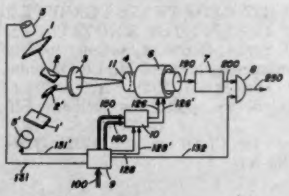
received by a photocell which produces varying output signals controlling regulating means by which the focal light spot is again centered on the track.

3,567,856

PATTERN GENERATOR APPARATUS

Koji Nezu, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed Feb. 18, 1969, Ser. No. 800,151
Claims priority, application Japan, Feb. 20, 1968, 43/10879
Int. Cl. H04n *5/30*
U.S. Cl. 178—7.2 **10 Claims**



Pattern generator apparatus is provided according to the present invention wherein image pickup means relying upon electron beam scanning is utilized to accomplish the translation of digital information into characteristic and symbolic information. In addition, prescanning of the target face of the image pickup means is relied upon prior to the read scanning thereof so that any residual image present thereon due to a preceding generation sequence in the area of the said target face to be read scanned may be erased. However, as such prescanning is restricted solely to the area of the target face which is to be read scanned, a high speed mode of generation is maintained. According to one embodiment of the present invention, the pattern generator apparatus includes a plurality of pattern carrying films and a plurality of associated flash tubes positioned in light communication with the target face of image pickup means having an electron beam scan, the plurality of associated flash tubes are adapted to be energized on a time division basis by digital signals applied thereto and said electron beam is adapted for prescanning and thereafter read scanning a predetermined portion of the target face of said image pickup tube in response to digital signals applied to the control means therefor.

3,567,857

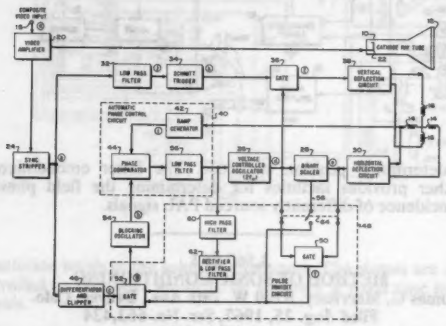
PULSE INHIBIT CIRCUIT

Robert E. Lynn, Somerville, N.J., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 15, 1968, Ser. No. 713,331
Int. Cl. H04n *5/10*
U.S. Cl. 178—7.3 **18 Claims**

The picture signal is removed from an amplified composite video input signal by a sync stripper. Vertical sync pulses extracted from the remaining composite synchronizing signal

periodically enable a gate to pass portions of a timing signal from an oscillator operating at twice the horizontal line rate. The gated portions of this timing signal periodically trigger a vertical deflection circuit to initiate retrace of the vertical field scans of an electron beam of a cathode ray tube. A binary scaler halves the repetition rate of the timing signal from the oscillator. The resultant signal periodically triggers a horizontal deflection circuit to initiate retrace of the horizontal line scans of the electron beam of the cathode ray tube. An automatic phase control circuit locks the oscillator in phase with the composite synchronizing signal and stabilizes the rate of the timing signal at twice the horizontal line



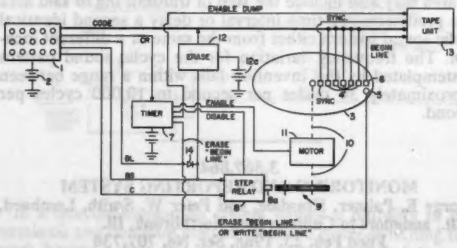
rate. In response to the signals from the oscillator and the binary scaler a control gate passes the horizontal timing portions of the composite synchronizing signal and inhibits passage of double frequency portions in the vertical synchronizing interval of the composite synchronizing signal. The horizontal timing portions are regenerated by a blocking oscillator and supplied to the automatic phase control circuit for phase and frequency comparison with a ramp signal generated in phase with and at the rate of the signal from the binary scaler. When the compared signals are not within the pull-in range of the automatic phase control circuit another control circuit prevents the inhibit cycle of the control gate.

3,567,858

APPARATUS FOR CONVERTING SLOW ERRATIC DATA TO HIGH EVEN DATA

John W. Ecklin, 40 Alexis Road, Woodbridge, Va. 22191

Filed June 6, 1968, Ser. No. 735,040
Int. Cl. H04l *13/08*
U.S. Cl. 178—17.5 **3 Claims**



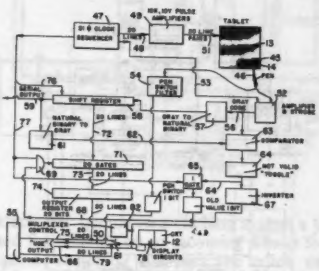
Data to be fed into a computer is typed on the keyboard of a modified teleprinter, providing a record. The electrical signals from the teleprinter are stored on a magnetic disc memory. On a carriage-return signal from the teleprinter, the memory rapidly reads out at a rate compatible to computer magnetic tape. If a typing error is made, the teleprinter carriage is backspaced, and the error manually erased from the print record by the typist. A signal is sent from the teleprinter to the memory when a backspace is performed, which signal backspaces the disc, and erases the last stored data signal. When the correct key of the keyboard is depressed, the correct signal is stored in memory and is typed on the print record.

3,567,859

CAPACITIVELY COUPLED GRAPHIC INPUT SYSTEM

Thomas O. Ellis, Palos Verdes Estates, and Malcolm R. Davis, Woodland Hills, Calif., assignors to the United States of America as represented by the Secretary of the Army

Original application , Ser. No. 378,786, now Patent No. 3,399,401. Divided and this application Feb. 16, 1968, Ser. No. 724,657
Int. Cl. H08b *5/00*
U.S. Cl. 178—18 **5 Claims**



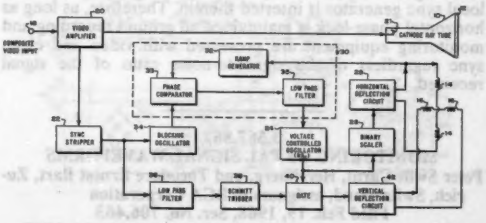
A graphic input device includes an electrical tablet having an insulated wire screen in which two sets of parallel wires are disposed at right angles to each other and a stylus capacitively coupled to the tablet. The tablet wires are cyclically energized according to a binary coding pattern by a set of capacitively coupled encoding pads.

3,567,860

TELEVISION SYNCHRONIZING SYSTEM

Bernard M. Oliver, Los Altos Hills; Richard E. Monnier, Sunnyvale, and Gregory Justice, Mountain View, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

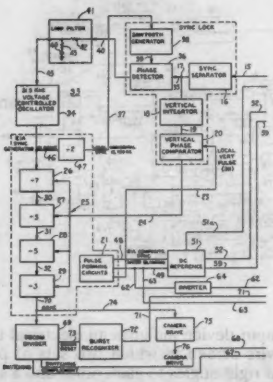
Filed Mar. 7, 1968, Ser. No. 711,414
Int. Cl. H04n *5/10*
U.S. Cl. 178—69.5 **14 Claims**



A sync stripper removes the picture signal from the composite video input signal leaving a composite synchronizing signal that includes horizontal and vertical sync pulses. An oscillator produces a periodic timing signal having a repetition rate equal to twice that of the horizontal sync pulses. This timing signal is supplied to a binary scaler to produce a synchronizing signal for periodically triggering a horizontal deflection circuit at a repetition rate equal to that of the horizontal sync pulses. A feedback circuit, responsive to this synchronizing signal and to the composite synchronizing signal, phase locks the oscillator to the composite synchronizing signal and maintains the repetition rate of the oscillator at twice that of the horizontal sync pulses. The timing signal is also supplied to a gate that is periodically ena-

bled in response to the vertical sync pulses to provide a synchronizing signal for periodically triggering a vertical deflection circuit at a repetition rate equal to that of the vertical sync pulses.

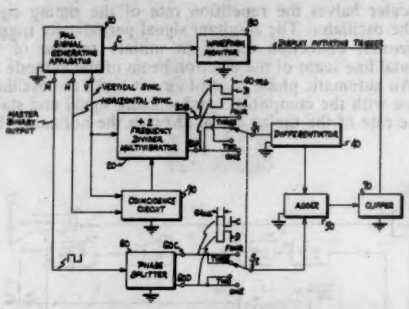
3,567,861
VIDEO/SYNC PROCESSOR
Darrow L. Webb, Cocoa, and Francis Byrne, Cocoa Beach, Fla. Assignor to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration
Filed Dec. 11, 1968, Ser. No. 782,956
Int. Cl. H04n *5/04*
U.S. Cl. 178—69.5 **2 Claims**



A video sync processor which includes a phase locked loop which compares the horizontal sync of an incoming video signal to the horizontal sync of a local sync generator and thereby locks a voltage control oscillator of the processor to a master oscillator carried in the remote transmitting station. In this manner all local processing equipment is referenced to the remote master oscillator. Frequently, when signals are received from remote stations, such as spacecrafts, there is a low signal-to-noise ratio and the quality of the signal is poor. In order to improve the stability of the composite signal the sync and blanking portion are stripped from the incoming video signals and a clean sync and blanking signal from the local sync generator is inserted therein. Therefore, as long as horizontal phase-lock is maintained all ground recording and monitoring equipment are presented with video and clean sync regardless of the signal-to-noise ratio of the signal received.

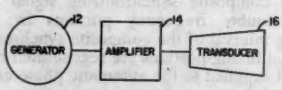
3,567,862
MONITORING OF PAL SIGNAL WAVEFORMS
Peter Swift Carnt, Herrliberg, and Theodore Ernest Bart, Zurich, Switzerland, assignors to RCA Corporation
Filed Feb. 19, 1968, Ser. No. 706,463
Claims priority, application Great Britain, Feb. 24, 1967, 8835/67
Int. Cl. H04n *7/02*
U.S. Cl. 178—5.4 **6 Claims**

Apparatus and methods for the selective identification and display of four unique fields in the PAL system. Trigger pulses are generated to enable selective display by a waveform monitor of the vertical blanking interval waveforms of any desired field in the four field sequence. Pursuant to a first embodiment, particularly useful where there is available from equipment being monitored (half line frequency) master binary output keyed to the burst phase alternation as well as sync pulse outputs, the trigger pulse generation is achieved by apparatus including coincidence circuits responding to sync signals and master binary waveforms. In accordance with a further embodiment, of more universal applicability, the trigger pulse generating apparatus requires only a composite video signal input. In the latter embodiment, facilities are provided for simultaneously displaying the four unique vertical interval waveforms, one above the other, in a



predetermined position sequence. The latter embodiment further provides facilities for determining the field phase coincidence of differently sourced PAL signals.

3,567,863
METHOD OF SONIC CONDITIONING
Thomas G. Morrissey, 5700 W. 28th Ave., Denver, Colo.
Filed Aug. 25, 1967, Ser. No. 663,424
Int. Cl. H04r *3/00*
U.S. Cl. 179—1 **7 Claims**

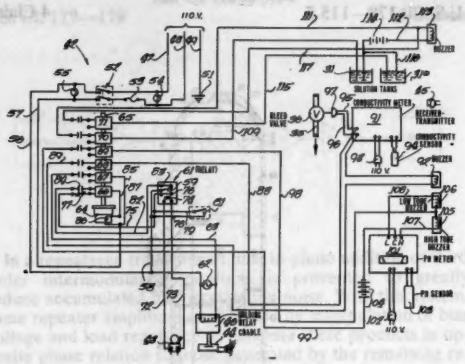


A method of sonic conditioning an area comprising the step of radiating in said area a cyclic sonic pattern having random variations of predetermined limits of amplitude in the audible frequency range, said limits of amplitude falling within a range of approximately 85 to 100 percent of the maximum amplitude for said sound pattern (and preferably within a range of approximately 88 or 90 to 100 percent of said maximum amplitude), said cyclic sound pattern having a sound pressure level sufficient to mask environmental sounds within said area. This method of sound conditioning may also include an additional step of transmitting to or radiating in said area from a second location a second cyclic sonic pattern as aforedescribed. This method of sound conditioning in an area may also include the step of transmitting to said area at a predetermined time interval or delay a second identical cyclic sound pattern either from the same or a different location. The frequency variation for the cyclic sound pattern contemplated by this invention falls within a range between approximately 30 cycles per second to 10,000 cycles per second.

3,567,864
MONITORING AND REPORTING SYSTEM
George E. Palmer, Hinsdale, and Peter W. Smith, Lombard, Ill., assignors to Culligan Inc., Northbrook, Ill.
Filed Feb. 23, 1968, Ser. No. 707,730
Int. Cl. H04m *11/04*
U.S. Cl. 179—5 **9 Claims**

A monitoring and reporting system utilized to check on the condition of a water circulating and treating system by means of a private telephone line where the dialing of the number for a telephone set at the situs of the system and the ringing of the telephone sets a control circuit into operation. The circuit includes a timer motor rotating a series of cams for snap switches which, when closed, actuate a circuit to sense a condition of the system and provide a short interval audible signal that is picked up by the telephone receiver. One snap switch actuates a device which lifts the cradle for the

telephone handset, and a series of buzzers are positioned adjacent the receiver which are connected to the condition indicators such as for conductivity, pH level, and chemical



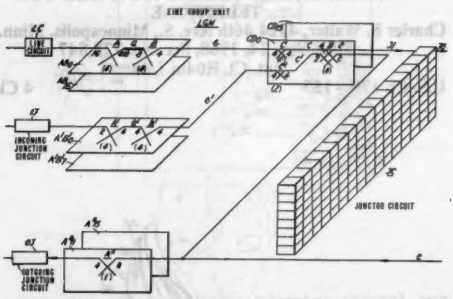
solution levels in the solution containers. The signals are controlled by the timer motor to be actuated at fixed time intervals.

3,567,865

CROSS POINT SWITCHING NETWORK IN A TELECOMMUNICATION SYSTEM

Pe Tsi Chu, Vence, France; Hans Helmut Adelaar, Kapellenbos, and Alois Rene Termote, Edegem, Belgium, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jan. 18, 1968, Ser. No. 698,924
Claims priority, application Netherlands, Jan. 23, 1967, 6,701,049
Int. Cl. H04g 3/60
U.S. Cl. 179—18 **17 Claims**



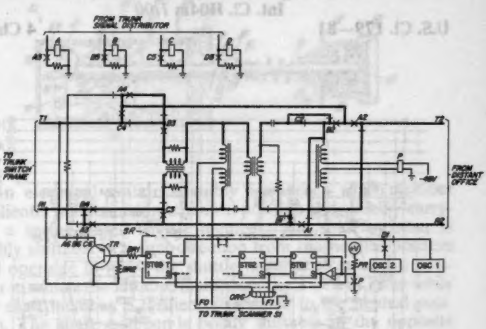
In a telecommunication system having a plurality of line terminals and common control means, a novel switching network having a first and a second part is provided through which communication paths are established between selected pairs of the line terminals coupled to the first part. A first group of a plurality of output terminals of the first part is connected to a plurality of input terminals of the second part. A second group of the output terminals of the first part is directly connected to a selected group of output terminals of the second part. This manner of interconnection between the first and second parts eliminates the need for an additional switching network otherwise required in prior art devices for completing the communication paths between selected pairs of the line terminals.

3,567,866

TRUNK CIRCUIT WITH PULSE DELAY

Bruce E. Briley, Countryside, and Victor Hachenburg, Naperville, Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 11, 1968, Ser. No. 736,171
Int. Cl. H04q 1/32
U.S. Cl. 179—18 **10 Claims**



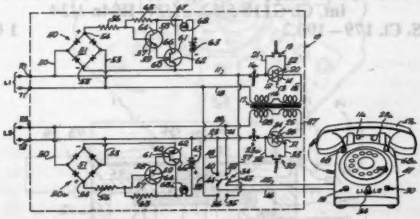
In an electronic telephone-switching system a trunk circuit is disclosed for connection to incoming trunks from step-by-step telephone-switching systems. The trunk circuit incorporates delay means for delaying all incoming dial pulses for a predetermined period thereby allowing the switching system sufficient time after trunk seizure to establish a connection from the trunk circuit to a dial pulse receiver by means of a switching network.

3,567,867

SUPERVISORY LAMP SYSTEM FOR TELEPHONE CONFERENCE CONNECTION AND CALL TRANSFER DEVICES

Charles F. Rice, Miami Shores, and Charles Kimtantas, Miami Springs, Fla.

Continuation-in-part of application Ser. No. 572,045, Aug. 12, 1966, now Patent No. 3,470,322. This application Sept. 30, 1969, Ser. No. 862,188
Int. Cl. H04m 3/42
U.S. Cl. 179—81 **6 Claims**



A supervisory lamp system for use in conjunction with a conference connection and call transfer device for effecting call transfer or conference connection between two or more mutually remote telephone subscribers at a subscriber station having a plurality of telephone circuit subscriber lines is described. Connection of or "seizing" of any of the interconnected lines is signalled by the lighting of an associated supervisory lamp at the controlling subscriber station, which supervisory lamp automatically goes out upon disconnect effected by "hanging up" of the associated remote subscriber set. When setting up conference connection between two or more remote subscriber stations without monitoring at the controlling subscriber station, accidental actuation of disconnect switches at the controlling station is prevented by having said switches arranged within the cradle of the controlling subscriber desk set in such a manner that when the handset

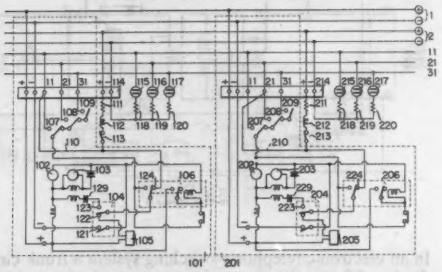
portion is placed upon the cradle, said switches are protectively covered.

3,567,868

INTERPHONE DEVICE HAVING PRESENCE INDICATOR MEANS

Toru Mukae, and Tadashi Akiyama, Tokyo, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Aug. 27, 1968, Ser. No. 755,621
Int. Cl. H04m *1/00*
U.S. Cl. 179—81 4 Claims



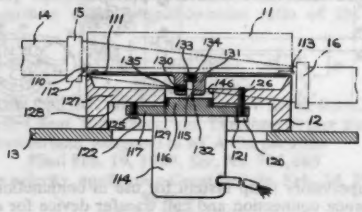
An interphone designed for mutual conversation-type interphone systems and having a plurality of high impedance lamps the turning-on of which indicates the presence of personnel by the corresponding other interphones. A capacitor is connected to the lamp source supply lines for preventing crosstalk.

3,567,869

MAGNETIC RECORDING AND REPRODUCING APPARATUS WITH ROTATING HEAD INCLINATION AND HEIGHT-ADJUSTING MEANS

Akira Hirota, Chigasaki; Keiichi Sekine, and Junichi Ura, Yokohama, Japan, assignors to Victor Company of Japan Limited, Yokohama, Japan

Filed Mar. 6, 1968, Ser. No. 710,907
Claims priority, application Japan, Mar. 7, 1967, 13920
Int. Cl. G11b *5/52, 21/24;* H04n *1/24*
U.S. Cl. 179—100.2 1 Claim



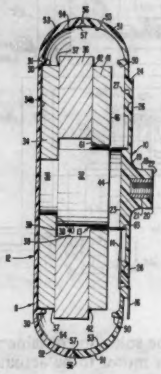
A magnetic recording and reproducing apparatus has a rotating member, provided with magnetic heads, in a cylindrical magnetic tape guide member assembly. A magnetic tape travels over the guide obliquely relative to the axis of rotation of said rotating member to successively record or reproduce high-frequency signals such as television video signals in oblique tracks. The apparatus permits the matching of tracks on the magnetic tape by adjusting the angle of inclination of the axis of rotation of the rotating member and the height of the rotating member.

3,567,870

WALL SURFACE TRANSDUCER SYSTEM

Benigno A. Rivera, Rio Piedras, Puerto Rico, assignor to Harold D. Linden and Lawrence A. Gordon, San Juan, Puerto Rico

Filed July 25, 1968, Ser. No. 747,699
Int. Cl. H04r *9/00*
U.S. Cl. 179—115.5 4 Claims



A transducer assembly for mounting on a wall surface or other surface for converting electrical energy to sound or vice versa. The invention is an improvement on prior art devices of similar character in providing improvement in frequency response and truer sound reproduction. The improvement comprising a housing formed from two cup-shaped members whose edges of peripheral joinment are curved surfaces, the curvature of said surfaces being identical, equal, and complementary to each other. Consult the specification for other features and details of the invention.

3,567,871

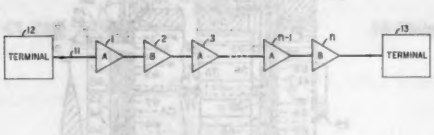
SHOULDER SUPPORT AND HAND GRIP FOR TELEPHONE

Charles F. Walter, 4124 46th Ave. S., Minneapolis, Minn.

Filed Nov. 14, 1968, Ser. No. 775,847
Int. Cl. H04m *1/04*
U.S. Cl. 179—157 4 Claims

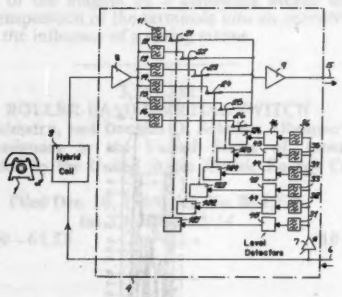
A telephone handset support block having a concave, shoulder-engaging pocket with an inclined surface which serves to tilt the handset receiver and transmitter portions towards the user at a convenient angle. A slightly convex surface on a base portion of the support block serves as a hand grip by means of which a telephone handset of the type having a built-in dial may be balanced and supported when dialing.

3,567,872
THIRD ORDER COMPENSATION IN REPEATERED TRANSMISSION LINES
Sundaram Narayanan, Lawrence, Mass., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.
Filed June 9, 1969, Ser. No. 831,563
Int. Cl. H04b *3/36*
U.S. Cl. 179—170 5 Claims



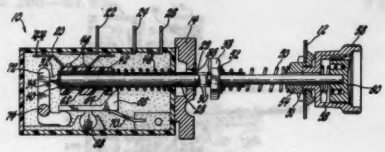
In a repeatered transmission line, in-phase addition of third order intermodulation products is prevented to greatly reduce accumulated intermodulation noise. With this system, some repeater amplifiers are adapted by manipulation of bias voltage and load resistance to generate these products in opposite phase relation to those generated by the remaining repeaters, thereby causing cancellation.

3,567,873
ECHO-SUPPRESSION AND NOISE-ELIMINATION SYSTEM FOR TELEPHONE CIRCUITS
Bruno Peroni, Rome, Italy, assignor to Consiglio Nazionale delle Ricerche, P. Ie delle Scienze and Fondazione U. Bordoni, Rome, Italy
Filed Dec. 22, 1967, Ser. No. 692,783
Claims priority, application Italy, Dec. 24, 1966, May 27, 1967, 43785;37064
Int. Cl. H04b *3/24*
U.S. Cl. 179—170.2 9 Claims



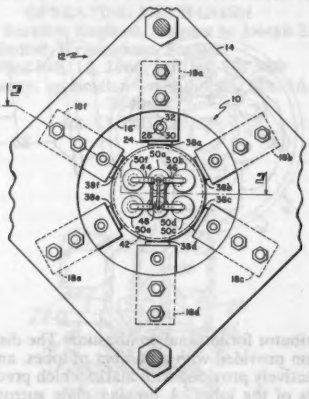
An incoming and an outgoing telephone channel, connected to a local line via a hybrid coil, are each provided with a multiplicity of parallel branch paths including respective band-pass filters selecting different subbands in a band of voice frequencies to be transmitted or received, the filters of each channel being in series with respective relay contacts so controlled in response to incoming voice signals that subbands whose frequencies predominate in the incoming signal are selectively received by the local line while being blocked in the outgoing channel for the suppression of echoes. The selective opening of some relay contacts may be limited to periods of two-way communication, with the aid of a monitoring circuit responding to the concurrent presence of different frequencies in the two channels; alternatively, the monitoring circuit may be responsive to a single pilot frequency which is suppressed at the receiving side of the hybrid coil so that its presence in the outgoing channel can be due only to a voice signal originating at the local station.

3,567,874
ELECTRICAL SLIDE SWITCH WITH IMPROVED CONTACT CARRIER LATCHING MEANS
Robert T. Strobel, Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Nov. 26, 1969, Ser. No. 880,333
Int. Cl. H01h *15/00*, *15/18*
U.S. Cl. 200—16 3 Claims



An electrical switch assembly includes a shaft member resiliently maintained in a neutral position and slidably carrying a spring-biased shuttle member. The shaft member is bodily shiftable in a first direction from the neutral position and operable to move the shuttle member to an active position in which the latter is maintained by a detent lever while the shaft member is resiliently returned to the neutral position. The shaft member is bodily shiftable in the opposite direction from the neutral position to activate release means to disengage the detent lever from the shuttle member so that the latter may be displaced from the active position.

3,567,875
ELECTRICAL SWITCH APPARATUS
Richard E. Perrin, and Billy A. Hopper, Tulsa, Okla., assignors to Avco Corporation, Tulsa, Okla.
Filed June 30, 1969, Ser. No. 837,744
Int. Cl. H01h *15/00*
U.S. Cl. 200—16 4 Claims

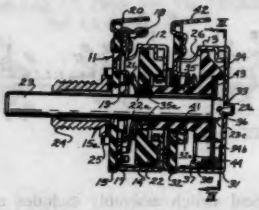


An electrical switch apparatus is disclosed in which making and breaking of electrical contact is made through the sliding engagement of two contact members, one of which is mounted for limited movement normal to the axis of movement of the second contact member.

3,567,876
COMBINATION VARIABLE RESISTANCE AND ELECTRICAL SWITCH ACTUATING MEANS
John Zdanys, Jr., Edwardsburg, Mich., assignor to C T S Corporation, Elkhart, Inc.
Filed Sept. 23, 1968, Ser. No. 761,602
Int. Cl. H01h *3/00*
U.S. Cl. 200—17 11 Claims

An electrical control has a variable resistance control combined with a normally open switch. Any manual adjustment

made to the variable resistance control causes the switch contacts to be closed before actual adjustment of the variable resistance control begins and, after the force causing manual



adjustment of the control is removed, the switch contacts are opened without disturbing the resistance setting of the control.

3,567,877

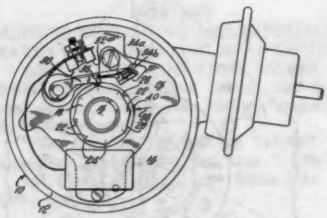
IMPROVED ADJUSTMENT MEANS FOR DISTRIBUTOR CONTACTS AND BEARINGS

Herbert Y. Awaya, 3268 Kilihune Place, Honolulu, Hawaii

Filed July 3, 1969, Ser. No. 838,979

Int. Cl. H01h *19/00, 19/62*

U.S. Cl. 200—19 **9 Claims**



A distributor for internal combustion. The distributor has a rotary cam provided with a number of lobes, and these lobes are respectively provided with marks which precisely indicate the crests of the lobes. A breaker plate surrounds the cam and carries a swingable contact arm one end of which is successively engaged by the cam lobes. This end of the contact arm and the breaker plate are respectively provided with marks which when respectively aligned with a pair of the marks of a pair of cam lobes indicate that the points are set at their widest gap, so that it then becomes possible to adjust the gap between the points.

3,567,878

SYNCHRONIZING CONTROL SWITCH ADAPTED FOR FRICTION CLUTCH USE

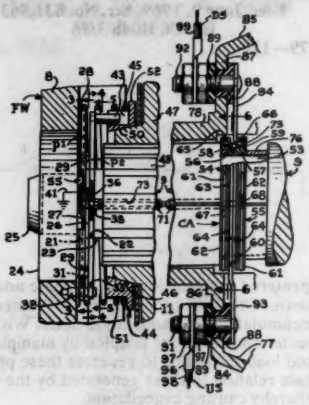
Glenn T. Randol, Mountain Park, 3E 2nd Ave. P. O. Box 275, Loch Lynn Heights, Md. 21550

Filed Jan. 13, 1969, Ser. No. 790,672

Int. Cl. H01h *35/00*

U.S. Cl. 200—52 **12 Claims**

A synchronizing mechanism having an actuatable switch embodied in the flywheel-carried friction clutch used in motor vehicles and the like, for activating carburetor throttle-closing and opening means to modulate engine speed ac-



cordingly into synchronism with that of the clutch driven member prior to clutch lockup.

3,567,879

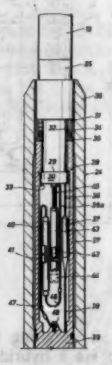
APPARATUS FOR FACILITATING THE DESCENT OF CABLE-SUSPENDED WELL TOOLS THROUGH DEVIATED WELL BORES

Stanley T. Dueker, and John E. Key, Jr., Houston, Tex., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed May 2, 1969, Ser. No. 821,254

Int. Cl. H01h *35/14, 36/00*

U.S. Cl. 200—52 **4 Claims**

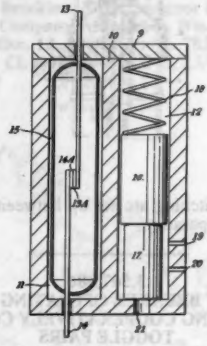


As one embodiment of the new and improved apparatus disclosed herein, a well tool having force-responsive signalling means thereon is dependently coupled to an electrical logging cable that is uniquely constructed to withstand limited axial compressive loading without undue lateral bending. In this manner, by selectively moving the suspension cable downwardly from the surface, corresponding axial forces are imposed on the well tool for assisting its continued descent through substantially-deviated well bore intervals. The motion-responsive signalling means are responsive, therefore, to the application of such forces to the tool for indicating that these axial compressive forces are being transmitted through the cable to the tool.

3,567,880
SUBMARINE SIGNALLING DEVICE AND FAIL-SAFE SWITCH

Malcolm George Palmer, Blakedown, near Kidderminster; Frederick Arthur Ridgway, Stourbridge, and Edwin Leslie Minshull Roberts, Harborne, Birmingham, England, assignors to Albright & Wilson Limited, Oldbury, near Birmingham, Warwickshire, England

Filed May 13, 1969, Ser. No. 824,058
Claims priority, application Great Britain, May 24, 1968, 24991/68
Int. Cl. H01h *35/00*
U.S. Cl. 200—61.08 10 Claims

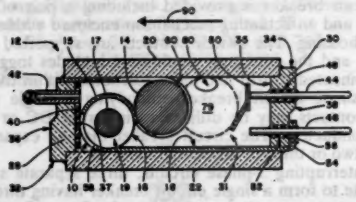


A submarine detonation device comprises a sea water switch and/or a fail-safe switch. The sea water switch comprises an anode, a cathode and a floodable interelectrode interspace. The fail-safe switch comprises two terminals held in nonoperative position by the field of a magnet, which magnet is retained in position by a water-soluble retaining plug. On submersion the retaining plug disintegrates so allowing displacement of the magnet by a displacing means and consequent transposition of the terminals into an operative position under the influence of a spring means.

3,567,881
ROLLER-BAND INERTIAL SWITCH

Fred A. Duimstra, and Douglas O. Schuler, Albuquerque, N. Mex., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed Dec. 10, 1969, Ser. No. 883,736
Int. Cl. H01h *35/14*
U.S. Cl. 200—61.53 10 Claims

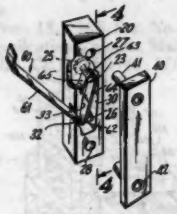


A roller-band inertial switch operable over a predetermined temperature range including a housing; a roller-band cluster disposed within the housing and having a first roller, a second spool-shaped roller and a tension band supporting the rollers within the housing, said band including an oblong orifice adjacent the spool-shape roller and a force-biasing opening adjacent the other roller to bias the cluster adjacent an end wall of the housing; electrical sensing means disposed at the other end wall of the housing to sense movement of the cluster to the other end wall; and a damping fluid in the housing filling the housing at a temperature above the predetermined temperature range and a method for forming the housing.

3,567,882
BURGLAR ALARM SWITCH

Jack Beck, 1730 Montgomery Ave., Bronx, N.Y. 10453

Filed May 15, 1970, Ser. No. 37,783
Int. Cl. H01h *3/02*
U.S. Cl. 200—61.93 5 Claims

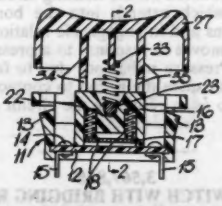


A burglar alarm and switch system comprising a switch having a unitary springlike contact element positioned within a recess of an integral block and resiliently held between two contact screws to provide a normally open or a normally closed switch. One end of the contact element is substantially fixed in position or anchored in the block contacting one of the contact screws while the extending portion is bent around in the recess to resiliently make and break contact with the other contact screw.

3,567,883
SNAP ACTION SWITCHES WITH IMPROVED OPERATING MECHANISM

Keith Lewis, Burnley, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Feb. 10, 1969, Ser. No. 797,880
Claims priority, application Great Britain, Feb. 16, 1968, 7640/68
Int. Cl. H01h *15/18*
U.S. Cl. 200—68 2 Claims

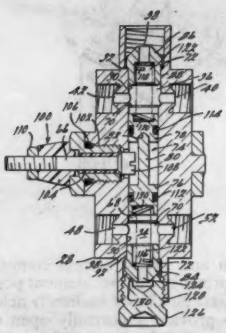


The electrical switch includes a casing having a base carrying fixed contacts, and a movable contact assembly slidable relative to the base, the movable contact of the assembly being engageable with the fixed contacts. Detent means are provided on the movable contact assembly and the casing for locating the movable contact relative to the base in any one of a number of operative positions, and an operating member is provided for moving the movable contact assembly. Resilient means acts between the movable contact assembly and the operating member, and the operating member is provided with cam means for releasing said detent means during movement of the operating member. During movement of the operating member as the detent means is released, said resilient means is stressed so that when the detent means releases the resilient means moves the movable contact assembly relative to the fixed contacts.

3,567,884
SAFETY SIGNAL FOR BRAKING SYSTEMS

Joseph W. Douglas, Southfield, and Bernard J. Besso, Grosse Pointe, Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Dec. 23, 1965, Ser. No. 515,882
Int. Cl. H01h 35/38, 35/40
U.S. Cl. 200—82 3 Claims



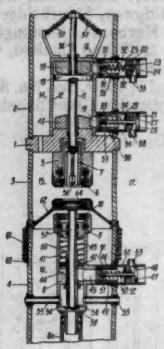
A warning apparatus composed of a signal device and a hydraulic differential pressure responsive control for indicating damage or failure of one of the brake circuits in a dual brake system. The control includes a housing having a bore in which is slidably disposed a piston having end portions in sealing engagement with the bore and an intermediate portion of reduced diameter, the piston ends, reduced diameter portion, and the bore forming a chamber which is at atmospheric pressure throughout operation of the brakes. The housing has passageways at both ends of the piston which enable fluid to flow through the housing and contact the outer faces of the piston. A switch connected in circuit to the signal device is mounted on the housing and has a switch actuating portion which extends into the bore between the piston end portions and in engageable relationship therewith when the piston moves in response to a pressure differential acting thereon. Pressure imbalance due to failure of one of the brake circuits causes the piston to contact the switch actuating portion so as to complete the circuit and actuate the signal device.

3,567,885
ISOLATOR SWITCH WITH BRIDGING RESISTANCE AND EXTINGUISHING GAS CONTROL

Rintje Boersma, Harmelen, Netherlands, assignor to N.V. "KOQ", Utrecht, Netherlands

Filed Aug. 19, 1968, Ser. No. 753,612
Claims priority, application Netherlands, Aug. 23, 1967, 67.11576
Int. Cl. H01h 33/80
U.S. Cl. 200—148 5 Claims

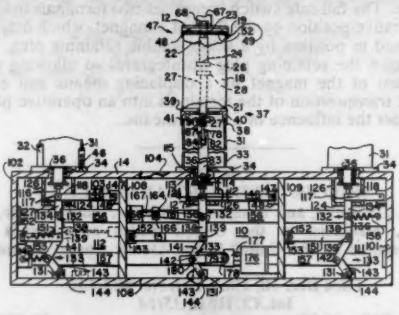
A gas blast circuit-breaker for isolating purposes and switching normal loads only, comprising a fixed main contact, a movable main contact cooperating therewith and two cooperating movable arcing contacts, of which the first one is rigidly connected with the movable main contact and the second one is electrically connected with the fixed main contact and is adapted to move, during the switching-off operation, together and in contact with the first arcing contact till a little past the separation of the main contacts, said second arcing contact being formed as a nozzle contact, the passage of which is opened during the switching-off operation as to allow extinguishing gas to escape from the switching chamber to quench the switching arc set up between the arcing contacts after their separation.



3,567,886
CIRCUIT BREAKER OPERATING MEANS COMPRESSING COOPERATIVELY CONNECTED TOGGLE PAIRS

Hugh C. Ross, 11915 Shadybrook Court, Saratoga, Calif.

Filed Feb. 16, 1968, Ser. No. 710,431
Int. Cl. H01h 3/46, 9/28, 33/52
U.S. Cl. 200—153 15 Claims



A circuit breaker is provided including a pair of switch contacts and an actuating mechanism enclosed within a supporting housing. The switch contacts are supported on the housing, and the actuating mechanism includes toggles and links connected to trip and close solenoids within the housing. A single circuit breaker embodying a single pair of switch contacts may be utilized to interrupt DC or single-phase conductors. The circuit breaker may be expanded to include two or three or additional switches.

For interrupting 3-phase circuits, three separate switches cooperate to form a single circuit breaker having three pairs of contacts to separately control each phase of a 3-phase electrical circuit. The three switches are securely mounted on the top panel of a single housing within which is enclosed the mechanism actuable to insure substantially simultaneous operation of the three switches upon closing or opening action. Actuating rods on the three switches extend through the top panel into the housing, where the actuating rods are interconnected by toggles and thrust links under the control of the trip and close solenoids to actuate the three switches simultaneously.

When constructed as a transfer circuit breaker assembly to transfer a load between preferred and alternate power sources, a pair of identical circuit breakers are arranged side-

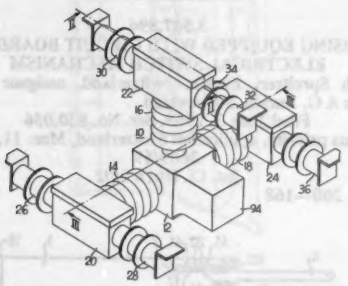
by-side and interconnected so that when one circuit breaker is actuated to make a circuit through the alternate source, the opposite circuit breaker is actuated to break the circuit through the preferred source. The relationship of the two circuit breakers arranged for performance of a transfer function is such that the 3-phase circuit through the preferred source is broken before the adjacent circuit breaker makes the circuit through the alternate source, or vice versa.

3,567,887

MULTIPHASE ELECTRIC CIRCUIT BREAKER WITH PHASES ARRANGED RADIALLY ABOUT A COMMON HOUSING AND OPERATED BY A COMMON RECIPROCAL CAM

John J. Maloney, Brockton, Mass., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Dec. 13, 1968, Ser. No. 783,566
Int. Cl. H01h *3/42, 33/42, 33/66*
U.S. Cl. 200—153 **4 Claims**



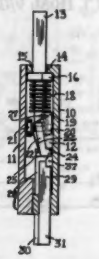
A three phase circuit breaker comprises a supporting housing having three insulating columns mounted on three different sides thereof but in the same plane. Each column has a casing mounted at its end. A pair of series connected vacuum switches are mounted on opposite sides of each casing in axial alignment with each other and transverse to the aforesaid plane. Each vacuum switch has a contact which is axially movable by a cam plate in the associated casing. Each cam plate is moved by a push rod which extends from the associated casing, through the associated insulating column into the housing. All push rods are operated by a single cam in the housing.

3,567,888

MOMENTARY PUSHBUTTON SWITCH WITH SPRING-BIASED PIVOTED ACTUATING MEANS MOMENTARILY ACTUATING CONTACTS AFTER COMPLETE DEPRESSION OF BUTTON

Eric L. Long, Highland Park, Ill., assignor to Cherry Electrical Products Corporation, Highland Park, Ill.

Filed Aug. 25, 1969, Ser. No. 852,747
Int. Cl. H01h *13/50, 13/22*
U.S. Cl. 200—160 **6 Claims**



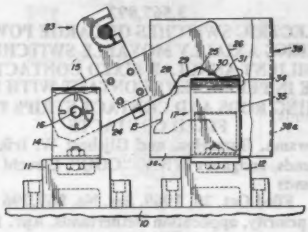
An electrical switch having a two-part actuator, the first part of which has a guided path of movement that is substantially linear and the second part being pivotally attached to one end of the first part of the actuator and having an independent pivotal movement in one direction under spring tension during which it closes the switch contacts disposed in its path to momentarily pulse the switch irrespective of any directional movement of the first part of the actuator after the same has moved a predetermined distance.

3,567,889

KNIFE SWITCH WITH PARTICULARLY SHAPED CONTACT BLADE

Charles Franklin Latter, Brampton, Ontario, Canada, assignor to Square D Company Canada Limited, Toronto, Ontario, Canada

Filed Nov. 15, 1968, Ser. No. 776,102
Claims priority, application Canada, Mar. 20, 1968, 015,367
Int. Cl. H01h *1/42, 21/54*
U.S. Cl. 200—162 **3 Claims**



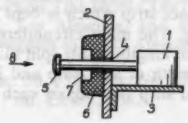
An edge of a free end portion of the contact blade facing the jaw members of the knife switch has a cutaway portion positioned toward the pivot axis of the blade from the free end of the blade. An outer side edge of the cutaway portion is chamfered and defines one side of an outer nose portion of the blade. The nose portion has a chamfered leading edge disposed at an acute angle with respect to the free end face of the blade.

3,567,890

LIMIT SWITCH

Rudi Kombuchen, Adlerstrasse 70, Dusseldorf, Germany

Filed Mar. 25, 1969, Ser. No. 810,284
Claims priority, application Germany, Apr. 10, 1968, A29,625
Int. Cl. H01h *21/28*
U.S. Cl. 200—166 **8 Claims**



An electric limit switch for use with a movable storage unit including a sensing member disposed through a buffer whereby the buffer acts to absorb forces to protect both the movable storage unit and the electric limit switch.

3,567,891

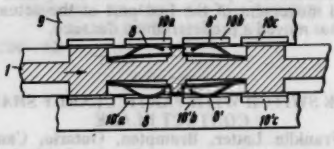
CONTACT ASSEMBLY FOR SLIDING SWITCHES

Rudolf Hinkelmann, Bad Neustadt/Saale, Germany, assignor to PREH Elektro-Feinmechanische Werke, Jakob Preh Nachf, Bad Neustadt Saale, Germany

Filed Aug. 18, 1969, Ser. No. 850,924
Claims priority, application Germany, Aug. 29, 1968, P 17 90 026.4
Int. Cl. H01h *15/06*
U.S. Cl. 200—166 **5 Claims**

A contact assembly for a sliding switch having a contact bridge made in one piece and disposed in a chamber in a

slide for cooperation with relatively fixed contacts spaced one from another in the direction of sliding movement of the contact bridge. The contact bridge having a substantially rectangular frame with the short sides formed integrally with



inwardly directed convex contact arms and the long sides provided midway with recesses engaged by projections of the chamber walls. The middle regions of the long sides rest on ledges provided in and at opposite sides of the chamber.

3,567,892

ELECTRIC SWITCHES OF LARGE POWER COMPRISING AXIALLY MOVABLE SWITCHING RODS AND RESILIENT ANNULAR FIXED CONTACTS WHICH ARE IN PERMANENT CONTACT WITH SAID SWITCHING RODS AND CONTACT STRIPS FOR SUCH FIXED CONTACTS

Rintje Boersma, Harmelen, and Gijsbert W. Irik, Bilthoven, Netherlands, assignors to N.V. "COQ", Utrecht Kanaalweg, Netherlands

Filed Oct. 20, 1969, Ser. No. 867,796
Claims priority, application Netherlands, Apr. 15, 1969, 69.05749
Int. Cl. H01h *1/10*
U.S. Cl. 200—166 **6 Claims**

An electric switch having an axially movable switching rod and a fixed contact which is in permanent contact with said switching contact. The fixed contact comprising a zigzag folded metal contact strip which is bent in the shape of an uninterrupted ring. The inner circumference of said ring is bent in the shape of longitudinally split tubes extending in the direction of the width of said strip and interconnecting the parts of the folded strip that adjoin each other at said inner circumference.

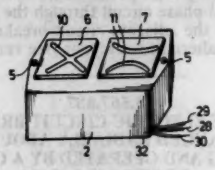
3,567,893

ELECTRIC CONTROL DEVICE, ESPECIALLY FOR THE REMOTE CONTROL OF SWITCHES, SIGNALS, AND THE LIKE, FOR TOY AND MODEL RAILROAD INSTALLATIONS

Max Ernst, 85 Lohengrinstr. 14, Nuremburg, Germany

Filed July 1, 1969, Ser. No. 838,160
Claims priority, application Germany, July 4, 1968, P1,703,742
Int. Cl. H01h *9/18*
U.S. Cl. 200—167 **11 Claims**

The invention relates to a switch arrangement especially for use with model railway systems and the like in which the switch comprises a housing consisting of a base member and a member resting thereon consisting of a top plate and a depending peripheral portion. A pair of switch keys are mounted in the top plate and elements of normally open switches are mounted on the base plate for actuation by the aforementioned keys. The switch elements have connected and in parallel therewith, lamp bulbs with the lamp bulb pertaining to the switch elements operated by one key being



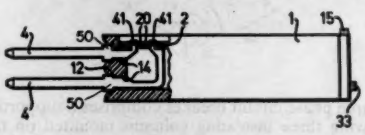
located under the other key. The elements of the switches are in the form of metal strips secured to the base member by tabs which extend through slots in the base member and which are bent over on the bottom of the base member.

3,567,894

HOUSING EQUIPPED WITH CIRCUIT BOARD FOR ELECTRICAL SWITCH MECHANISM

Helmuth Spreitzer, Zurich, Switzerland, assignor to Contraves A G, Zurich, Switzerland

Filed June 3, 1969, Ser. No. 830,056
Claims priority, application Switzerland, Mar. 11, 1969, 3609/69
Int. Cl. H01h *9/02*
U.S. Cl. 200—168 **4 Claims**



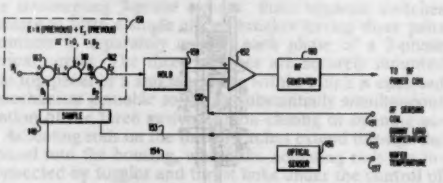
A novel housing is disclosed, the housing having at least one stationary circuit board for an electrical switch or other device therein. Current conducting tracks leading to contact ends are disposed in the plane of the stationary circuit board, such contact ends being arranged along a housing wall disposed transverse to the plane of the circuit board. Connecting pin members having connection legs which are flexed toward the circuit board extend transversely through the housing wall and are mechanically retained therein. The flexed connection legs of the connecting pin members pass through the circuit board in each instance at the region of the contact ends of the current conducting tracks and are electrically and mechanically connected therewith.

3,567,895

TEMPERATURE CONTROL SYSTEM

Oded Paz, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 11, 1969, Ser. No. 849,029
Int. Cl. H05b *9/06, 5/00*
U.S. Cl. 219—10.77 **16 Claims**



A temperature control system useful for epitaxial growth of silicon wafers in a reactor comprising in one embodiment

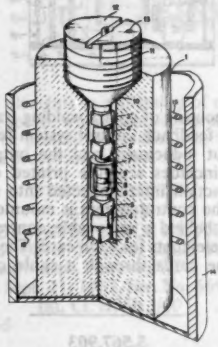
an RF feedback loop and two temperature feedback loops, e.g. a thermocouple loop and an optical sensor loop. The structure and method disclosed generate error signals so that correctional factors sequentially derived, in cascade form from the optical sensor loop, the thermocouple loop and the RF loop, provide a resultant signal employed to correct the reactor temperature.

3,567,896

METHOD AND APPARATUS FOR HOT PRESSING

Ji Young Chang, Oak Ridge, Tenn., assignor to the United States of America, as represented by the United States Atomic Energy Commission

Filed Sept. 25, 1969, Ser. No. 860,879
Int. Cl. H05b 1/00
U.S. Cl. 219—50 6 Claims



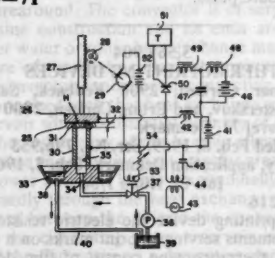
A method and apparatus for generating pressures wherein a highly anisotropic pyrolytic graphite body having its highest coefficient of linear thermal expansion in the direction of an axis thereof is confined in a pressing vessel together with a compactible material which is positioned along said axis. Heating of the anisotropic body expands the same along said axis to compress the compactible material. The pressing vessel is composed of a material having a low coefficient of thermal expansion relative to the anisotropic body. Preferably, the pressing vessel is composed of isotropic graphite, so that high pressures can be generated by furnacing the entire assembly at temperatures as high as 2200° C.

3,567,897

HEATING THE UNDERSURFACE OF A CONDUCTIVE BODY BY ELECTRIC CURRENT CONDUCTED THERETO BY A SHAPED STREAM OF ELECTROLYTE

Kiyoshi Inoue, 100 Sakato, Kawaski, Kanagawa, Japan

Filed Mar. 11, 1968, Ser. No. 719,288
Claims priority, application Japan, Mar. 17, 1967, 42/16756;42/16757
Int. Cl. B23p 1/04, 1/08
U.S. Cl. 219—71 5 Claims



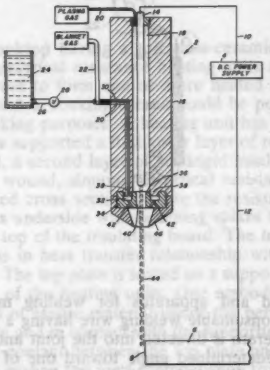
In a system for applying a predetermined pattern to the surface of a metallic workpiece a tubular electrode is prepared with a cross section transverse to the direction of flow of an electrolyte through the electrode, corresponding to the desired pattern. A jet of electrolyte is trained upwardly from this tubular electrode against the underside of the workpiece at a distance of 0.1—10 mm therefrom while an electrolytic heating current is applied between the electrode and the workpiece. The pattern corresponding to the electrode cross section is found to be formed on the workpiece surface.

3,567,898

PLASMA ARC CUTTING TORCH

Samuel Fein, Irwin, Pa., assignor to Crucible Inc., Pittsburgh, Pa.

Filed July 1, 1968, Ser. No. 741,593
Int. Cl. B23k 9/00
U.S. Cl. 219—121 7 Claims



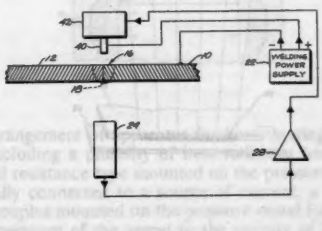
Water introduced to a plasma jet near its base dissociates into hydrogen and oxygen, adding material and force to the jet and tending to make it more straight-sided and stable. Near the tip of the plasma jet, the hydrogen and oxygen recombine, affording heat. Materials difficult to cut with a torch using known methods, such as inch-thick plates of stainless steel or high-speed tool steel, may be cut at substantially higher traverse rates. Moreover, the kerf is straight-sided and lustrous, rather than being concave and having a dull, oxidized appearance.

3,567,899

WELD-PENETRATION CONTROL

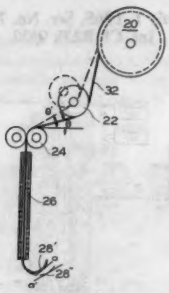
William F. Iceland, Los Alamitos, and Martin E. O'Dor, Downey, Calif., assignors to North American Rockwell Corporation

Filed Mar. 30, 1966, Ser. No. 538,650
Int. Cl. B23k 9/12
U.S. Cl. 219—125 10 Claims



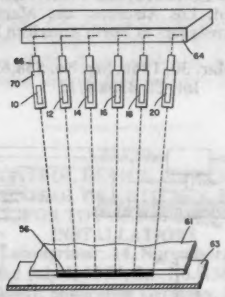
In order to provide improved weld-penetration control, the temperature produced by the welding operation is monitored; and resultant control-signals are used to produce improved welding.

3,567,900
WELDING METHOD AND APPARATUS
Jerome W. Nelson, Houston, Tex.; Robert E. Pollock, Hilliard, and Robert P. Meister, Columbus, Ohio, assignors to The Battelle Development Corporation, Columbus, Ohio
Continuation-in-part of application Ser. No. 570,868, Aug. 8, 1966. This application Aug. 14, 1968, Ser. No. 756,721
Int. Cl. B23k 9/26
U.S. Cl. 219—130 15 Claims



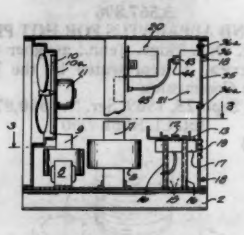
A method and apparatus for welding metal members wherein a consumable welding wire having a permanent set imparted thereto is directed into the joint and emerges at a constant predetermined angle toward one of the members. The wire is oscillated about its longitudinal axis during feeding whereby the emerging arcuate portion travels in a predetermined arcuate pattern within the joint.

3,567,901
WELDING MONITOR SYSTEM USING PHOTOCELLS
Harry T. Deininger, Jr., Willingboro, N.J., and Jay F. Whitsel, Southampton, Pa., assignors to The Budd Company, Philadelphia, Pa.
Filed Dec. 18, 1968, Ser. No. 784,848
Int. Cl. B23k 9/00
U.S. Cl. 219—131 10 Claims



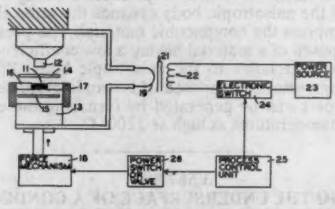
Apparatus for detecting the presence or absence of an arc weld along a path of an article to be welded includes a plurality of photocells responsive to light from the arc to generate output signals. A detector circuit is actuated by the output signals to indicate a complete or incomplete weld of the article.

3,567,902
ARC WELDING POWER SUPPLY ASSEMBLY
James B. Stearns, Elm Grove, and Robert W. Wendelburg, Milwaukee, Wis., assignors to Chemetron Corporation, Chicago, Ill.
Filed Apr. 25, 1969, Ser. No. 819,333
Int. Cl. B23k 9/10
U.S. Cl. 219—131 10 Claims



The physical housing of an arc welding transformer-rectifier unit having a feedback control system for controlling the slope, the output inductance and the output voltage. The control system includes separate printed circuit cards for each control function interconnected into a master printed circuit board. The control system is mounted within a housing immediately behind a removable control box having individual control elements for each card. The box is releasably connected to the cards through a cable connected to the master board.

3,567,903
METHOD OF BONDING PARTICLES INTO UNITARY BODIES
John C. Parker, Bloomfield Hills, Mich., assignor to Quanta Welding Company, Melvindale, Mich.
Filed July 19, 1968, Ser. No. 746,055
Int. Cl. B21j 1/06; H05b 1/00
U.S. Cl. 219—149 15 Claims

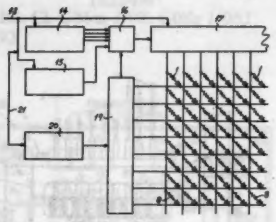


A method for bonding particles into an integrated mass by placing the particles, which may be in powder form, in a confining structure, and applying to the body of powder a controlled pulse, impulse or burst of electrical or electromagnetic energy, or a combination thereof, in conjunction with a controlled pressure pulse.

3,567,904
THERMOPRINTING DEVICES
Henning Gunnar Carlsen, 2900 Vedbaek, Sandbjergvej, Sandbjerg Osterskov, and Erling Carlsen, 2800 Kgs. Lyngby, Fuglevadsvej 71, Denmark
Filed Feb. 6, 1969, Ser. No. 796,955
Claims priority, application Denmark, Feb. 8, 1968, 493/68
Int. Cl. H05b 1/00
U.S. Cl. 219—216 5 Claims

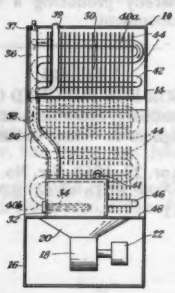
In a thermoprinting device the electric resistors forming the printing elements serving to print marks on a thermosensitive sheet by thermocopying consist of film deposits in a plurality of superposed microlayers on a surface on an electrically insulated base member, said layers being separated by electrically insulating films. Important forms of superposed printing elements are complementary bar groups of a bar mosaic, and a full selection of full character printing ele-

ments placed on top of one another. Electronic means are provided for either activating the printing elements of a row successively or simultaneously, or simultaneously activating



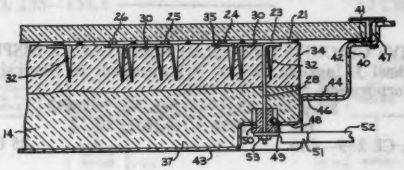
selected printing elements in a plurality of rows, thereby increasing printing speed, where signals representative of lines of characters to be printed are available in rapid succession, such as from data processing equipment.

3,567,905
HOT WATER SPACE HEATER
Emanuel Ferraro; Oliver Ferraro; James Ferraro, and Paul Ferraro, 916 Baldwin St., Pittsburgh, Pa. 15234
Filed Sept. 21, 1967, Ser. No. 669,434
Int. Cl. H05b *3/00*
U.S. Cl. 219—365 **13 Claims**



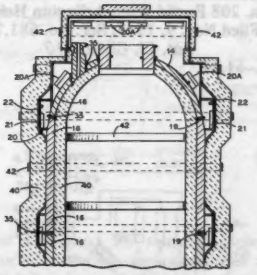
A hot water forced air circulation heater is disclosed and is particularly adapted for use with one or more electric immersion heating elements. The space heater includes a casing having an upper heat exhanger section and a lower blower section. A convector structure is mounted within the heat exchange section and arranged for the output of the blower to flow therearound. The convector is of serpentine or double serpentine construction and its ends are coupled to a reservoir for water or other heat exchange medium heated by one or more of the heating elements mounted in the reservoir. The convector-conduit and convecting fins associated therewith are sized such that heat exchange water is returned to the reservoir with a substantial quantity of sensible heat to minimize thermal cycling of the heating element or elements and to increase the effective heat transfer area of the convector. The blower output is blown longitudinally of the convector or upwardly through the heat exchange section to maximize contact between the air and the convector. In one arrangement the circulating water reservoir is mounted near the base of the convector on a projecting portion of the casing and is connected through a riser conduit to the inlet at the top of the convector. The upper portion of the convector can be arranged to overhang the reservoir to facilitate connection of the convector to the riser conduit and to give direction to hot air issuing from the space heater.

3,567,906
PLANAR SURFACE HEATER WITH INTEGRAL FASTENERS FOR HEATING ELEMENT
Bohdan Hurko, Louisville, Ky., assignor to General Electric Company
Filed Apr. 14, 1969, Ser. No. 815,649
Int. Cl. H05b *3/68, 3/06, 3/16*
U.S. Cl. 219—464 **4 Claims**



A heated cooktop having a top glass-ceramic plate with one or more electrical resistance heating units adjacent the underside thereof to form one or more heated areas of the plate upon which a cooking utensil could be positioned for heating or cooking purposes. A heating unit has a base plate upon which are supported a first lower layer of resilient insulation material, a second layer of semirigid insulating board, and a closely wound, sinuous, electrical resistance heating wire of flattened cross section, where the resistance wire is provided on its underside with fastening spikes that are embedded in the top of the insulating board. The top of the resistance wire is in heat transfer relationship with the glass-ceramic plate. The top plate is seated on a supporting surface independently of the heating units. One embodiment incorporates a strip of elastic material under the peripheral edge of the top plate and in contact with the supporting surface to prevent direct contact between the top plate and supporting surface, while sealing the joint therebetween from the accumulation of liquids and soil.

3,567,907
APPARATUS FOR HEAT TREATING A PRESSURE VESSEL
Otis R. Carpenter, Barberton, Ohio, assignor to The Babcock & Wilcox Company, New York, N.Y.
Filed Apr. 30, 1968, Ser. No. 725,352
Int. Cl. C21d *1/30*
U.S. Cl. 219—483 **10 Claims**



An arrangement of apparatus for heat treating a pressure vessel including a plurality of heat radiating heaters of the electrical resistance type mounted on the pressure vessel and electrically connected to a source of current, a plurality of thermocouples mounted on the pressure vessel for measuring the temperature of the vessel in the vicinity of each of the heaters, and an insulating material blanketing both the interior and exterior of the vessel. Means are provided for displaying the temperature of the vessel as measured by each of the thermocouples and the current to each of the heaters is adjusted in consideration of the measured temperatures to heat treat the vessel to a predetermined tensile strength. A plurali-

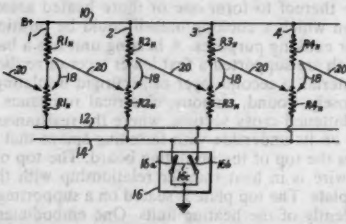
ty of timers are provided to adjust the current to the heaters, at least one electrical contact being associated with each timer and operable thereby. The contact of each timer acts as a switch in the electrical connection between the source of current and a particular heater. Each timer is preset to open and close the contact associated therewith for predetermined time intervals in consideration of the tensile strength of the pressure vessel adjacent the heater associated with that contact.

3,567,908

DRIVE CIRCUITS FOR SOLID STATE CLOCK DISPLAYS

Michael J. Ingenito, Bronx, N.Y., assignor to General Time Corporation, Stamford, Conn.

Filed Jan. 23, 1969, Ser. No. 793,492
Int. Cl. H05b *3/10*; H01j *39/12*
U.S. Cl. 219—486 **25 Claims**



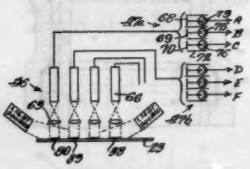
The disclosed solid state clock drive circuit comprises cascaded ring counters, whose stages comprise at least one heater element and one thermistor. A bistable switch, in response to timing pulses, alternately connects alternate stages of each ring counter to a current source such that energizing current flows through only one stage of each ring counter. Thermal coupling between the heater element and thermistor of adjacent stages controls the transfer of energizing current flow from stage to stage upon operation of the switches. A material applied to each heater element produces a visual effect when heated, thus developing a time display.

3,567,909

INFORMATION HANDLING SYSTEM

Dillis V. Allen, 208 Euclid Ave., Arlington Heights, Ill.

Filed Nov. 9, 1967, Ser. No. 681,754
Int. Cl. G06k *7/10*
U.S. Cl. 235—61.11 **3 Claims**



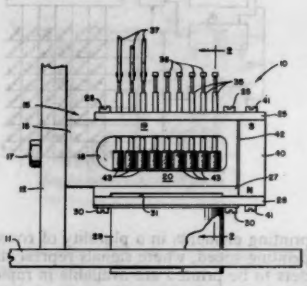
An optical information handling system including an encoded information carrier in which information is represented by marks which transmit one of a plurality of optical wave length signals, the marks being arranged in quadricode form, and a reading and decoding network for receiving the optical wave length signals from the marks, translating the signals into a modified binary representation and decoding the modified binary representation into a true binary output.

3,567,910

TAPE READER

Richard E. Sims, Des Plaines, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Feb. 5, 1968, Ser. No. 702,988
Int. Cl. G06k *5/02*
U.S. Cl. 235—61.11 **8 Claims**



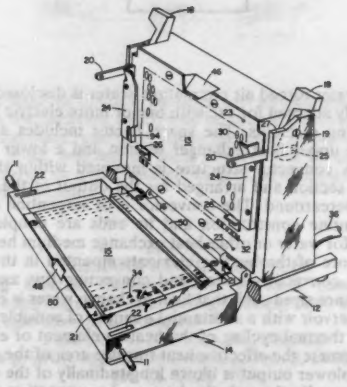
A tape reader or verifier including a reading member or punch pin for penetrating a hole in a document, a member mounted for engagement by the reading member or punch pin upon penetration, a permanent magnet for magnetically coupling the reading member or punch pin and the member mounted for engagement by the reading member or punch pin thereby forming a normally open magnetic circuit that is closed upon penetration of the document and a coil of conductive wire positioned around the reading member or punch pin for producing an electric pulse upon an increase in the amount of flux flowing the magnetic circuit caused by the closure thereof thereby producing a signal indicative of penetration of the document.

3,567,911

SENSOR FOR PUNCHED CARDS

Donald Nestor Grundberg, Stoneham, and Ge Yao Chu, Lincoln, Mass., assignors to Wang Laboratories, Inc., Tewksbury, Mass.

Filed Apr. 23, 1968, Ser. No. 723,516
Int. Cl. G06k *7/06*; H01h *43/08*; H01r *25/00*, *29/00*
U.S. Cl. 235—61.11 **10 Claims**

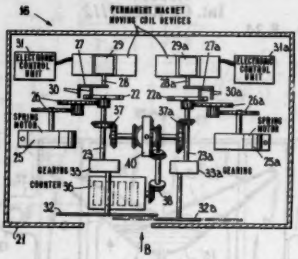


A sensor for punched cards and the like providing arrays of self-cleaning contacts of high reliability economically fabricated from standardized modular components. Contact combs having a linear set of bifurcated contact fingers are interleaved with spacers to form a planar array of contact pairs.

3,567,912
COUNTING DEVICES INCLUDING AN ESCAPEMENT

Donald William Neild, Gatley, England, assignor to The General Electric Company Limited, London, England

Filed Apr. 16, 1968, Ser. No. 722,140
Claims priority, application Great Britain, Apr. 20, 1967, 18224/67
Int. Cl. G06m 3/08; G08g 1/065
U.S. Cl. 235—92 5 Claims

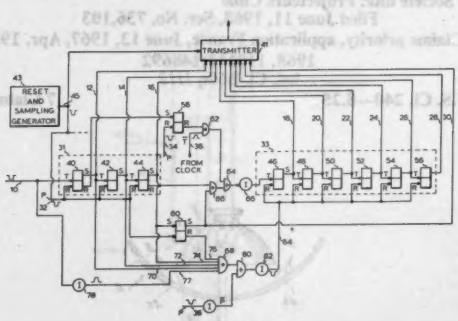


A counting device for use in a road toll charging or similar system has a number of escape members each driven by a long-life clockwork-type mechanism differently linked to a counter so that under the control of input means responsive to different signals radiated by roadside sources the counter is operated by a different amount corresponding to the particular input signal received. In particular whole units or fractions of units can be registered when a vehicle carrying the counting device uses a road zone or a parking zone respectively.

3,567,913
COUNTER

James E. Webb, Administrator of the National Aeronautics and Space Administration with respect to an invention of William E. Baumer, San Peoro, and John D. Timm, Camarillo, Calif.

Filed Apr. 24, 1968, Ser. No. 723,827
Int. Cl. H03k 2/16; G06m 3/02
U.S. Cl. 235—92 7 Claims

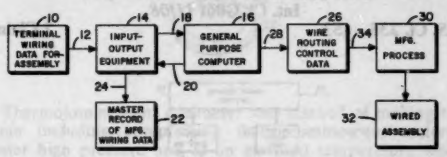


Pulse counting apparatus capable of operating over a wide range of pulse rates, which indicates the exact time of occurrence of pulses occurring at long intervals and the pulse rate for pulses occurring at short intervals. The circuit comprises a first portion for registering the first seven pulses to be received, a second portion for counting the number of clock signals generated before a first pulse is received by the counting apparatus, and a third portion for erasing the clock signal count in the second portion and enabling the second portion to count additional pulses received by the counter when seven or more pulses have been received.

3,567,914
AUTOMATED MANUFACTURING SYSTEM

Jerry L. Neese, St. Paul; Harold J. Lindee, Minneapolis; Edward F. Melin, St. Paul; John H. Pemberton, St. Paul; Clarence C. Pittenger, St. Paul Park, and William M. Swenson, St. Paul, Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 31, 1964, Ser. No. 422,682
Int. Cl. G06f 15/46; G05b 19/18
U.S. Cl. 235—151.1 12 Claims

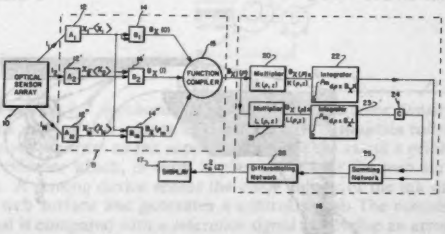


The method of fabricating printed circuit terminal interconnection assemblies including the steps of (a) reading manifestations from a record medium indicative of predetermined terminal interconnections to be formed between designated terminals in a coordinate array; (b) providing signals ordered according to a predetermined system indicative of ordered terminal interconnections in response to the manifestation so read and staring said signals; (c) reading the stored signals and generating terminal interconnection numerical control parameters defining nonintersecting printed circuit paths to be formed on a predetermined coordinate terminal array; and (d) recording the numerical control parameters on a record medium for use in the control of the operation of a numerically controlled reproduction apparatus.

3,567,915
METHOD OF AN APPARATUS FOR REMOTELY DETERMINING THE PROFILE OF FLUID TURBULENCE

Saul Altshuler, Manhattan Beach; Donald Arnush; Leonard Glatt, Palos Verdes, and Arthur Peskoff, Los Angeles, Calif., assignors to TRW Inc, Redondo Beach, Calif.

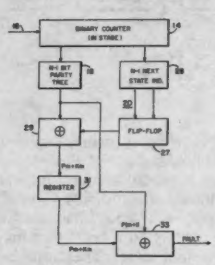
Filed July 22, 1969, Ser. No. 843,418
Int. Cl. G01b 15/04
U.S. Cl. 235—151.3 11 Claims



Apparatus and a method for remotely determining the profile of fluid turbulence such, for example, as clear-air turbulence. The intensity of an acoustic wave passing through a liquid, such as water, or the intensity of an electromagnetic wave, such as light, passing through air is determined at a plurality of different locations. In the electromagnetic case this may be done by a set of spaced telescopes and photosensitive devices or by optically scanning the density of a previously exposed photographic plate. An electric signal representative of the intensity of the acoustic or electromagnetic wave is then developed, and a second electrical signal is obtained which is representative of the spatial correlation function of the fluctuations of the logarithm of the first electrical signal. Thus, specifically the logarithm of the intensity is taken and the spatial correlation of the fluctuations is derived. Finally, a third signal is derived from the second signal. This third signal is representative of the integro-dif-

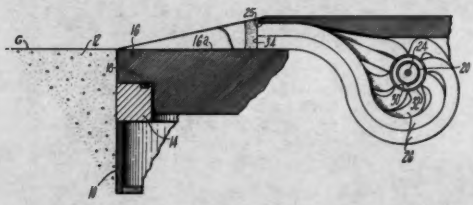
ferential transform of the second signal. This third signal then represents the desired profile of, for example, the clear-air turbulence.

3,567,916
APPARATUS FOR PARITY CHECKING A BINARY REGISTER
James M. Fulton, Jr., Greensboro, N.C., assignor to the United States of America, as represented by the Secretary of the Army
Filed Jan. 22, 1969, Ser. No. 792,931
Int. Cl. G06f 11/08
U.S. Cl. 235—153 2 Claims



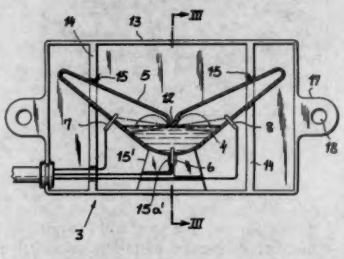
The parity of a shift register and a binary counter are checked by predicting what the parity change should be and comparing this with what the actual parity is. In checking a shift register the parity of the next state is determined by sensing the number of "ones" entering and leaving the register. This gives the change in the number of "ones" in the register; therefore, letting one know whether the parity will change or not. The same is done in checking a binary counter. All the consecutive "ones" (starting with the lowest order stage) are counted. With this any change in the parity of the next count can be predicted.

3,567,917
RUNWAY LIGHT
William C. Daley, Suffield, Conn., assignor to Structural Electric Products Corp., Windsor Locks, Conn.
Filed Aug. 6, 1968, Ser. No. 750,637
Int. Cl. B64f 1/20
U.S. Cl. 240—1.2 6 Claims



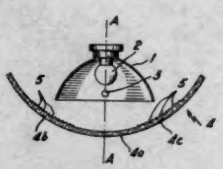
An inset runway light having a shallow optical system for collecting the light generated by a light source and elevating and bending the light rays so that the emitted light hugs the runway in a prescribed pattern and direction. The light-collecting ends of a plurality of flexible light-conveying conduits are arranged in contact with each other in longitudinal and peripheral rows on a transparent support tube surrounding the light source and are bonded thereto to pick up the generated light. The light exit ends of the conduits are hermetically sealed in an exit port of the light fixture and may be pointed substantially parallel to the surface of the runway to emit the light over a light ramp parallel with the surface of the runway. The receiving end emitting ends of the light conduits may be enlarged or reduced in size and formed of any cross section to accommodate the geometry of the exit port and the transparent support tube which may also serve as the evaporator for a refrigerator conducting heat to the cover for the fixture.

3,567,918
CENTRIFUGALLY OPERATED CORNERING ILLUMINATOR FOR AUTOMOTIVE VEHICLES
Karl Schable, 68 Fersenbruch, Gelsenkirchen, Germany
Filed Oct. 22, 1968, Ser. No. 769,614
Claims priority, application Germany, Oct. 24, 1967, 1,655,189
Int. Cl. B60q 1/12
U.S. Cl. 240—8.24 7 Claims



A light system for directing headlight beams in the direction of vehicle turning in which at least one lamp on the vehicle is trained in each cornering direction and a centrifugally operated switch selectively illuminates the lamps. The switch comprises a hollow body containing a centrifugally displaceable liquid (e.g. mercury) and has upwardly divergent arms each receiving a respective contact in an electrical circuit with the corresponding layer. A central contact may be connected to one pole of the supply network. The switch preferably lies in a vertical plane perpendicular to the direction of travel on the vehicle.

3,567,919
SWIVELLING HEADLAMPS FOR SELF-PROPELLED VEHICLES
Jacques Alphen, La Celle Saint-Cloud, France, assignor to Societe dite: Projecteurs Cibie
Filed June 11, 1968, Ser. No. 736,103
Claims priority, application France, June 13, 1967, Apr. 19, 1968, 110111;148692
Int. Cl. B60q 1/12
U.S. Cl. 240—8.25 7 Claims



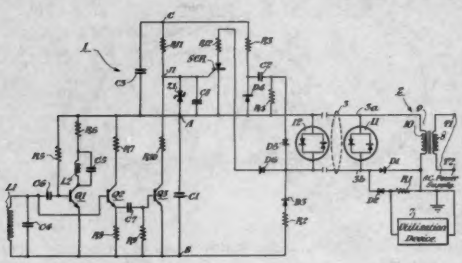
Swivelling headlamp includes reflector pivotable about a vertical axis and adapted to swing in response to turning of a vehicle's front wheels. A stationary lens having a substantially smooth central portion causing little light despersion, and fluted lateral areas serving to spread the beam width and reduce its height is fix to the coachwork of the vehicle in front of the pivotable reflector. The pivotable reflector may be carried adjacent to stationary reflectors of other lamps.

3,567,920

PROXIMITY DETECTOR

Richard D. Campbell, Harmarville, Pa., assignor to Westinghouse Air Brake Company, Swissoale, Pa.

Filed Feb. 6, 1968, Ser. No. 707,362
Int. Cl. B61l *1/08*
U.S. Cl. 246—249 13 Claims



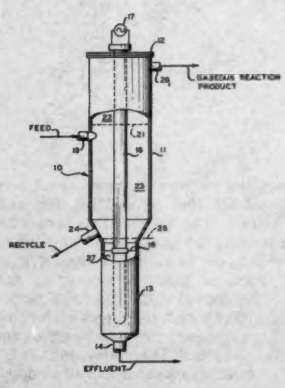
An electronic proximity detector for detecting a vehicle wheel traversing a track rail having a rail-mounted oscillating, amplifying and switching unit and a remotely located power and utilization unit electrically interconnected by an interface circuit having a rectifier network and a pair of electrical conductors for constantly supplying operating power to the rail-mounted unit and for operably providing an output signal to the remotely located unit during the presence of a vehicle wheel.

3,567,921

APPARATUS FOR THE CONTINUOUS PHOTOHALOGENATION OF HYDROCARBONS

Allan D. Holiday, Bartlesville, Okla., assignor to Phillips Petroleum Company

Original application Feb. 9, 1967, Ser. No. 614,932, now Patent No. 3,494,844, dated Feb. 10, 1970. Divided and this application Sept. 22, 1969, Ser. No. 870,860
Int. Cl. G01j *3/42*
U.S. Cl. 250—45 9 Claims



A photohalogenation apparatus having a gas liberation region above a reaction region, a gas outlet, a feed inlet and a product recovery outlet. A light source is associated with the reaction region to promote the halogenation reaction. Reactants flow downwardly in the vertical apparatus; the halogenated product being recovered from the lower portion of the apparatus.

3,567,922

THERMOLUMINESCENT DOSIMETER AND METHOD

Gerald E. Blair, Santa Barbara, Calif., assignor to EG & G. Inc.

Continuation of application Ser. No. 432,804, Feb. 15, 1965. This application July 1, 1968, Ser. No. 746,727
Int. Cl. C09k *1/06;* G01n *21/38*
U.S. Cl. 250—71 5 Claims

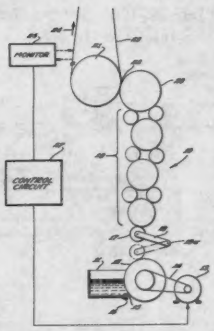
Thermoluminescent dosimeter and method of making the same including compressing thermoluminescent material under high pressure and at an elevated temperature while flushing the same with a dry inert gas thus forming the thermoluminescent material into a solid that may be sliced into dosimeter wafers. The process also activates coprecipitated calcium fluoride and manganous fluoride.

3,567,923

SYSTEM FOR MONITORING AND CONTROLLING THE COLOR DENSITY OF INK DURING PRINTING

Joel F. Hutchison, Danville, Ill., assignor to Hurletron Incorporated, Danville, Ill.

Filed Apr. 3, 1968, Ser. No. 718,618
Int. Cl. G01n *21/26;* B41f *31/12*
U.S. Cl. 250—226 12 Claims



A system for monitoring and controlling the color density of ink applied to a surface of a moving web. A fountain roller receives ink from an ink supply and applies the ink to a printing cylinder which, in turn, applies the ink to the web surface. A sensing device senses the color density of the ink on the web surface and generates a control signal. The control signal is compared with a reference signal to develop an error signal. A storage circuit receives the error signal and, a sampling circuit is connected to the storage circuit to generate a control voltage which controls the amount of ink applied to the printing cylinder.

3,567,924

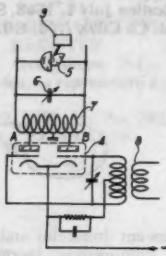
METHOD AND APPARATUS FOR BOMBARDMENT OF A TARGET BY MODULATED CIRCULAR SWEEPING

Guy Moisand, Dijon, and Michel Roche, Guetigny, France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed Aug. 29, 1967, Ser. No. 664,184
Claims priority, application France, Sept. 16, 1966, 76732
Int. Cl. H01j *37/28;* G01n *23/00*
U.S. Cl. 250—49.5 6 Claims

Bombardment of a target is performed by means of a method and apparatus for circularly sweeping said target

with a beam of charged particles subjected to the electric fields of two pairs of deflector plates to which are applied sinusoidal voltages displaced in phase by π/II; specifically, the method consists in forming a well focused particle beam



and in modulating said sinusoidal voltages so that they have the form

$$U=U_0(t)\sin.\frac{2\pi t}{T},$$

wherein U_0 varies as a function of time according to a relation of the form $U_0(t)=\sqrt{at+b}$.

3,567,925

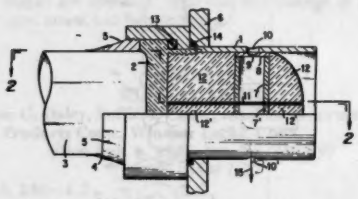
AN IMPROVED CHARGED PARTICLE DETECTOR

Marvin Luis Muga, Gainesville, Fla., and Howard E. Taylor, Oak Ridge, Tenn., assignors to the United States of America, as represented by the United States Atomic Energy Commission

Filed July 26, 1968, Ser. No. 748,067

Int. Cl. G01b *1/20*

U.S. Cl. 250—71.5 **3 Claims**



A new time-of-flight particle detector comprises an ultra thin plastic scintillator placed perpendicular to the face of a photomultiplier tube and sandwiched between two Lucite light pipes. The Lucite enclosure has a large hole for passage of fragments through the thin scintillator with a minimum energy loss, as small as 1 percent for fission fragments. A fission fragment, upon passing through the scintillator, triggers a light flash which traverses the film and light pipes and in turn is detected by the photomultiplier tube. Rise times of the order of 2 nanoseconds are achieved and the efficiency of detection is 100 percent for fission fragments. This detector has the great advantage of providing a clear distinction between time pulses and background noise.

3,567,926

ELECTRON SPECTROSCOPY SYSTEM WITH DISPERSION COMPENSATION

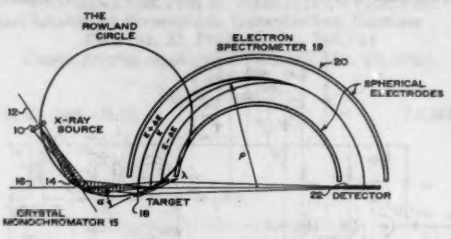
Kai M.B. Siegbahn, Uppsala, Sweden, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 4, 1968, Ser. No. 765,140

Int. Cl. G01n *23/22*

U.S. Cl. 250—49.5 **6 Claims**

A source of X-radiation and a target under study are mounted on the Rowland circle of a monochromator so that a characteristic line in the X-ray spectrum of the source is focused by the monochromator on the target. An electron spectrometer is employed to analyze the photoelectrons emerging from the irradiated target and to focus them on a detector. The geometry of the system is arranged to make the



dispersion of the monochromator equal in magnitude to and opposite in sign from the dispersion of the electron spectrometer so that these dispersions cancel out and the width of the X-ray line used to irradiate the target does not contribute to the width of the electron line detected by the detector.

3,567,927

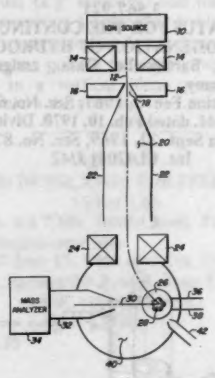
ION MICROPROBE MASS SPECTROMETER FOR ANALYZING FLUID MATERIALS

Alfred E. Barrington, Lexington, Mass., assignor to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Apr. 11, 1969, Ser. No. 815,367

Int. Cl. H01j *37/00*; G01n *23/00*

U.S. Cl. 250—49.5 **8 Claims**



An improved ion microprobe mass spectrometer type apparatus is provided that is suitable for analyzing trace amounts of a fluid. The present invention utilizes a target electrode for holding the sample, and a means for cooling the surfaces of the target to below a fixed temperature for a determined period of time. A stream of sample fluid is directed over the cooled surfaces of the target and is condensed thereon after which the target surface is sputtered by an incident, high intensity primary beam directed obliquely onto the surface thereof. Thereafter, means is provided for focusing the electrically charged ions of sample material that result in a secondary beam produced due to the bombardment of the sample layer. Additional means is provided to remove the prior material from the target surfaces after each analysis, so that the target surface is prepared for another sample layer.

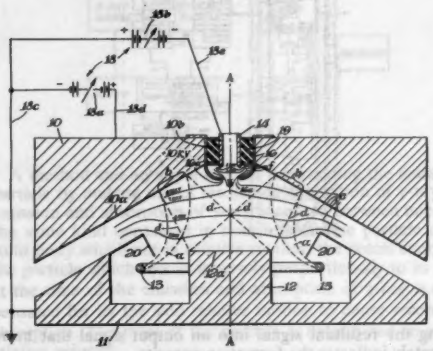
The invention described herein was made by an employee of the United States Government and may be manufactured and used by or for the Government for governmental purposes without the payment of any royalties thereon or therefor.

3,567,928

FLUORESCENT ANALYTICAL RADIATION SOURCE FOR PRODUCING SOFT X-RAYS AND SECONDARY ELECTRONS

Robert D. Davies, and Heribert K. Herglotz, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed June 12, 1969, Ser. No. 832,562
Int. Cl. G01n *23/22*
U.S. Cl. 250—51.5 3 Claims



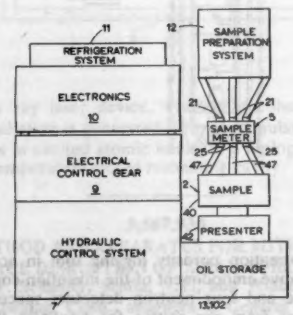
A fluorescent analytical radiation source concurrently producing fluorescent soft X-ray and secondary electron emissions with high efficiency provided with means for selective energy cut off of the secondary electrons in order to isolate secondary electron emission characteristic of specific elements under analysis.

3,567,929

APPARATUS AND METHODS FOR MAINTAINING SINTER FEED MIXTURES BY X-RAY FLUORESCENCE ANALYSIS

Gordon White, Bradway; Peter Hedley Barker, Sheffield, and Kenneth George Ridgeway, Wickersley, near Rotherham, England, assignors to British Iron & Steel Research Association, London, England

Filed Oct. 24, 1967, Ser. No. 677,641
Claims priority, application Great Britain, Oct. 26, 1966, 47989/66
Int. Cl. G01n *23/20*
U.S. Cl. 250—51.1 16 Claims



A machine for forming samples of powder into pellets and analyzing the pellets by X-ray fluorescence analysis. The pellets are formed by compacting powder in a die ring at a first position of the die which is then moved on a rotatable turret head to a second position under an analyzer head for analysis. The pellet is then disposed of as the die ring moves back from its second to its first position. The powder is compacted by means of a ram operable into one end of the die ring, the other end of the ring being closed by a movable pressure plate held in position during compacting by an annular and sleeve arrangement, the sleeve providing a passage for the powder to be fed initially to the die ring.

3,567,930

IMAGE ENHANCING METHOD FOR PHOTOGRAPHS, OIL PAINTINGS, AND WATER COLOR PAINTINGS

Max Jacobson, 8 East 83rd St., New York, N.Y.

Filed June 29, 1967, Ser. No. 649,866
Int. Cl. H01j *37/22*; G03b *41/16*
U.S. Cl. 250—65 5 Claims

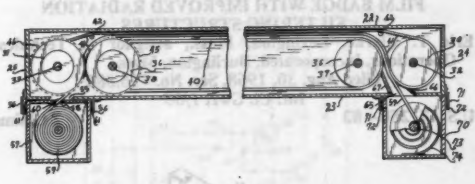
The method of enhancing the quality of permanent images by the process of irradiating the image with electromagnetic ionizing radiations such as gamma and X-rays from a weak proximately located source.

3,567,931

RADIOGRAPHIC FILM TRANSPORT WITH FILM CONVEYOR BELTS WHICH FUNCTION AS INTENSIFYING SCREENS

Herman H. Eelkema, 2121 Iglehart Ave, St. Paul, Minn.

Filed Oct. 10, 1969, Ser. No. 865,455
Int. Cl. G03b *41/16*
U.S. Cl. 250—66 4 Claims



Two continuous flexible sheets of material opaque to light but transparent to X-rays, each having on one side thereof a coating of crystaline material which emits light upon the impinging thereon of X-rays, the continuous sheets being mounted for continuous rotation with portions of each sheet being parallel and the coated surfaces of said portions being in juxtaposition, a strip of film having emulsion on at least one side thereof positioned between the juxtaposed portions of the sheets and means for simultaneously advancing each of the sheets and the film equal distances.

3,567,932

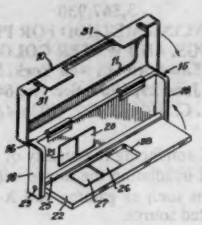
FLUORESCENT TRACER PROCESSES EMPLOYING A FLUORESCENT EUROPIUM CHELATE

James R. Alburger, 5007 Hillard Ave., La Canada, Calif.

Continuation-in-part of application Ser. No. 492,674, Oct. 4, 1965, now abandoned, Continuation-in-part of application Ser. No. 323,529, Nov. 13, 1963, now abandoned, Continuation-in-part of application Ser. No. 149,061, Oct. 31, 1961, now abandoned, Continuation-in-part of application Ser. No. 82,374, Jan. 13, 1961, now abandoned. This application Mar. 6, 1968, Ser. No. 711,105
Int. Cl. G01n *21/16*, *21/38*; C09k *1/00*
U.S. Cl. 250—71 2 Claims

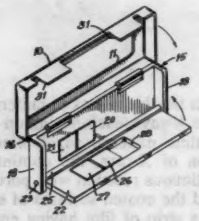
An inspection process and inspection tracer compositions which utilize fluorescent coordination compounds dissolved in liquid or resinous carriers. The fluorescent metal-organic coordination compounds provide unique effects of transparency to white light along with novel characteristics of fluorescent color. The tracer compositions disclosed may be utilized for the detection of surface defects in parts, as display elements (image-forming screens), or as marking materials.

3,567,933
HINGED RADIOLOGICAL FILM BADGE WITH FOLD-OVER FILM PACKET
Robert J. Prest, Concord, Mass., assignor to Technical Operations Incorporated, Burlington, Mass.
Filed Sept. 28, 1967, Ser. No. 671,390
Int. Cl. G01h 23/02; G01t 1/08
U.S. Cl. 250—83 7 Claims



A radiation monitoring film pack and a holder therefor are disclosed. The film pack has a wrapper with a flap extending from it for identifying data. The holder has means to hold the film pack, with suitable radiation filters, and a frame which overlies the film-holding structure and holds the flap framed on it with a surface visible on which the identifying data may appear.

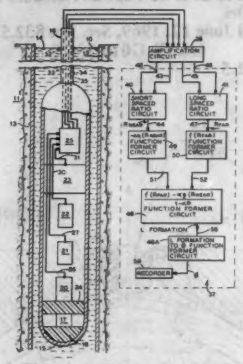
3,567,934
FILM BADGE WITH IMPROVED RADIATION FILTERING STRUCTURES
Eric T. Clarke, Lexington, Mass., assignor to Technical Operations, Incorporated, Burlington, Mass.
Filed Aug. 30, 1968, Ser. No. 756,582
Int. Cl. G01t 1/08
U.S. Cl. 250—83 2 Claims



A radiation monitoring film pack and a holder therefor are disclosed. The film pack has a wrapper with a flap extending from it carrying identifying data. The holder defines a slot for receiving the film pack, novel U-shaped radiation filters for shielding the film from edgewise, as well as head-on radiation, and a frame which overlies the film-holding structure and holds the flap such that a surface on which the identifying data appears is visible.

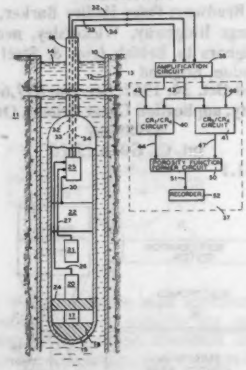
3,567,935
MEASURING APPARATUS AND METHOD
Walter A. Nagel, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.
Filed Feb. 7, 1968, Ser. No. 703,678
Int. Cl. G01t 3/00; G01v 5/00
U.S. Cl. 250—83.1 6 Claims

An earth formation porosity logging tool in accordance with an illustrative embodiment of the invention comprises a neutron source and four neutron detectors spaced at different distances from the source for transport through a borehole. Signals are obtained that correspond to the ratios of the counts registered by the two short-spaced detectors and the two long-spaced detectors. The effect of the borehole on the formation porosity measurement is compensated by combining these ratio signals to eliminate the influence of the borehold neutron relaxation length and con-



verting the resultant signal into an output signal that more accurately indicates the formation porosity.

3,567,936
MULTIPLE NEUTRON DETECTOR BOREHOLE LOGGING TOOL
Jay Tittman, Danbury, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.
Filed Feb. 7, 1968, Ser. No. 703,679
Int. Cl. G01t 1/16; G01v 5/00
U.S. Cl. 250—83.1 1 Claim



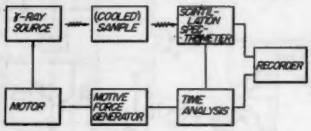
An earth formation porosity logging tool in accordance with an illustrative embodiment of the invention comprises a neutron source and four neutron detectors spaced at different distances from the source for transport through a borehole. Signals are obtained that correspond to the ratios of the counts registered by the two short-spaced detectors and the two long-spaced detectors. The effect of the borehole characteristics on the formation porosity measurement is compensated by directly contrasting these ratio signals with each other. A second illustrative embodiment of the invention using only three neutron detectors also is shown and described.

3,567,937

METHOD AND APPARATUS FOR DETERMINING THE MASS OF MICROFINE PARTICLES

Yoshimasa Murayama, Hachioji-shi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed June 13, 1967, Ser. No. 645,658
Claims priority, application Japan, June 27, 1966, 41/41371
Int. Cl. G01t 1/16
U.S. Cl. 250—83.3 4 Claims



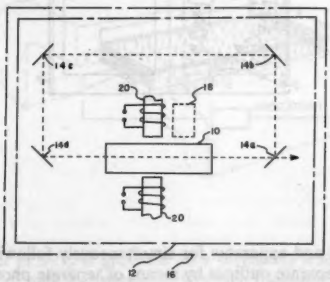
A method and an apparatus for determining the mass of a particle by making use of resonance absorption of γ-ray. An emission and absorption of γ-ray is caused between nuclei of the same kind contained in both a microfine particle and a solid body which are in relative motion; the recoil energy of the particle which recoils inversely proportionally to its mass at the time of the emission and absorption of γ-ray is compensated for by the said relative motion to cause resonance absorption. The mass of the particle is determined from the relative velocity.

3,567,938

GAMMA RAY LASER

Lawrence J. Piekenbrock, Longmont, Colo., assignor to Credo, Inc., Boulder, Colo.

Filed Feb. 14, 1968, Ser. No. 705,401
Int. Cl. G21h 3/00
U.S. Cl. 250—84 5 Claims



Gamma ray laser device, wherein a coherent beam of gamma radiation is generated through stimulation of gamma transitions in excited atomic nuclei in a biologically shielded and low temperature closed resonating cavity.

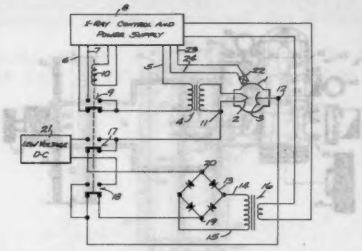
3,567,939

METHOD AND APPARATUS FOR MITIGATING SURFACE DISRUPTION OF X-RAY TUBE TARGETS

Harvey W. Schadler, Scotia, N.Y., and William P. Holland, West Redding, Conn., assignors to General Electric Company

Filed Nov. 4, 1968, Ser. No. 772,926
Int. Cl. H01g 1/32
U.S. Cl. 250—103 4 Claims

An x-ray tube target is heated to a temperature at which it is essentially ductile by directing a medium energy electron beam on it prior to and between normal high energy x-ray exposures. This permits the target surface to undergo plastic deformation rather than brittle fracture when it is subjected to the high mechanical stress caused by the large thermal gradients incidental to an exposure. Thus, target surface disruption is mitigated.

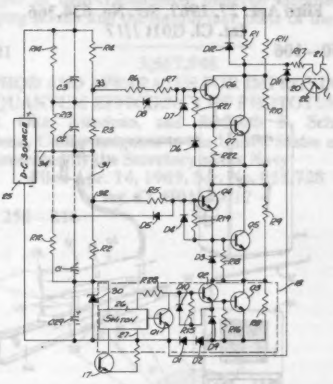


3,567,940

CINERADIOGRAPHIC X-RAY TUBE GRID PULSING CIRCUIT EMPLOYING SERIES CONNECTED HIGH VOLTAGE SWITCHING TRANSISTORS

Thomas W. Lambert, Hales Corners, Wis., assignor to General Electric Company

Filed Feb. 24, 1969, Ser. No. 801,376
Int. Cl. H05g 1/20, 1/60
U.S. Cl. 250—102 8 Claims



A light-emitting diode is pulsed at a preselected rate. Emitted light is conducted through a glass image conduit to a phototransistor which operates a solid state control switch at the same rate. The solid state switch controls conduction of a series connected string of transistors whose collectors swing from essentially zero voltage when the transistors are conducting to a high voltage when they are not conducting. The circuit features means for turning all of the transistors off in such manner that no transistor is subjected to overvoltage. The voltage pulses developed on the collector of the last transistor in the series may, for example, be applied to the grid of an x-ray tube to control its conduction intervals during high rate cinefluorography with an x-ray image converter. A signal that depends on image brightness is used to modulate the width of the pulses and, hence, the output of the x-ray tube so that each film frame has uniform exposure.

3,567,941

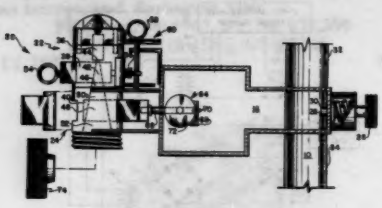
PORTABLE, NONELECTRICAL RADIOGRAPHIC DEVICE

Dennis R. Russell, and Samuel C. Crosby, Jr., Fort Worth, Tex., assignors to General Dynamics Corporation, Fort Worth, Tex.

Filed Dec. 23, 1968, Ser. No. 786,190
Int. Cl. G21h 5/00
U.S. Cl. 250—106 10 Claims

A readily conveniently portable nonelectrical radiographic device for exposing X-ray sensitive film by utilizing a radia-

tion source which emits electromagnetic radiation at or near the X-ray region (such as pure thulium 170 as the preferred source) as a gamma ray emission source and which incorporates multiple safety features integrally interrelated in such a manner as to enable a relatively untrained operator to utilize the machine or exchange power sources.

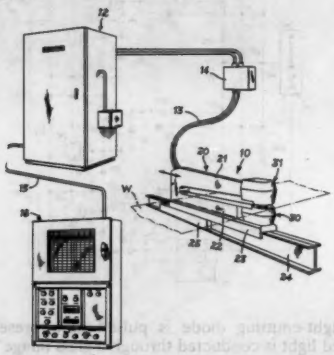


3,567,942

NUCLEONIC MEASURING APPARATUS WITH AUTOMATIC FIRE SAFETY RADIATION SOURCE SHUTTER CLOSING AND LOCKING MEANS CONTROLLED BY A FUSIBLE ELEMENT WHICH MELTS AT HIGH TEMPERATURES

Richard E. Bach, Hilliard, Ohio, assignor to Industrial Nucleonics Corporation

Filed Apr. 27, 1967, Ser. No. 634,366
Int. Cl. G01t *1/17*
U.S. Cl. 250—106 10 Claims



A nucleonic measuring instrument wherein a housing contains a radiation source and has an aperture controlled by a shutter which is spring loaded to a closed position for confining and shielding the radiation and is movable by a linear actuator to an open position for releasing the radiation, the actuator power being applied through a heat sensitive fuse so that it is deenergized and the shutter closes in response to a predetermined high ambient temperature such as may be caused by a fire, and including a spring-biased shutter locking pin retained in a retracted position by a meltable metal barrier which melts to release the pin in response to attainment of a predetermined higher ambient temperature and lock the shutter in the closed position.

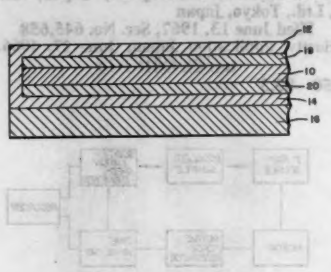
3,567,943

RADIOACTIVE PLATING FOR RADIOACTIVE FOILS

Clarence W. Wallhausen, Bernardsville, N.J., and Walter F. Buck, Bloomsburg, Pa., assignors to Nuclear Radiation Developments, Inc., Grand Island, N.Y.

Filed July 19, 1967, Ser. No. 654,328
Int. Cl. G21h *5/00*
U.S. Cl. 250—106 7 Claims

A radioactive product, and particularly a radioactive foil, comprising a radioactive core and a protective plating disposed over the core comprising gold alloyed with from 0.10 to 25.0 percent by weight of cobalt, cadmium, nickel, copper or silver.

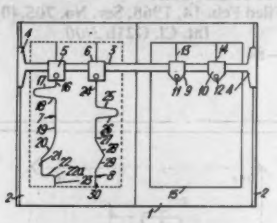


3,567,944

METHOD AND APPARATUS FOR SIMULTANEOUSLY FOLLOWING A PLURALITY OF OUTLINES

George J. Trapp, 105 Aylward Road, Merton Park, London, SW. 20, England

Filed Sept. 3, 1968, Ser. No. 756,879
Claims priority, application Great Britain, Mar. 19, 1968, 13288/68
Int. Cl. G05b *11/32;* H02p *5/50*
U.S. Cl. 250—202 13 Claims



Method and apparatus for simultaneously following a plurality of separate outlines by means of separate photoelectric line followers mounted for simultaneous longitudinal movement and independent transverse movement and each guiding a separate tool, in which movement signals from the line followers are compared, the signal which at any instant corresponds to the slowest longitudinal movement is selected, and the line followers are driven in the longitudinal direction at a speed related to the selected signal. In a modification one or more of the line followers may make reverse longitudinal movements while the others are stopped.

3,567,945

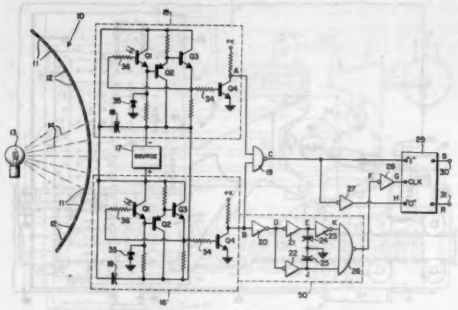
PHOTOELECTRIC ROTATIONAL DIRECTION SENSOR

Vernon L. Appleby, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 23, 1968, Ser. No. 786,261
Int. Cl. G01d *5/30, 5/247;* H03k *5/01*
U.S. Cl. 250—209 8 Claims

There is provided a system including a light source, which, in accordance with the operation of a rotating device, produces pulses of light which are applied to a logic circuit.

The circuit is capable of detecting the relative phase relationship between the light pulses and producing an output signal



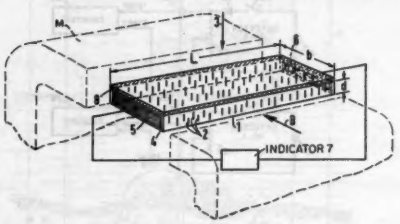
which is indicative of the direction of rotation of the rotating device.

3,567,946

RADIATION DETECTOR HAVING SEMICONDUCTOR BODY EXHIBITING A PHOTOTHERMOMAGNETIC EFFECT

Bernt Paul, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Filed Sept. 26, 1969, Ser. No. 861,354
Claims priority, application Germany, Sept. 27, 1968, 1,789,046
Int. Cl. H01j *39/12*
U.S. Cl. 250—211 **5 Claims**



A layer of SiO_x is provided on a surface of a semiconductor body of indium antimonide to which radiation is directed. x is equal to or less than 2 and equal to or greater than 1. The indium antimonide has embedded needle-shaped inclusions of a metal which is of better electrical conductance characteristic than the indium antimonide. The inclusions are in mutually parallel alignment parallel to the direction of radiation to be detected and perpendicular to the direction of a magnetic field in which the semiconductor body is positioned. The semiconductor body exhibits a photothermomagnetic effect.

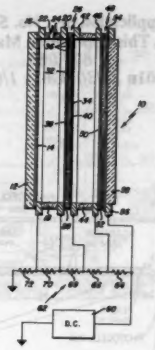
3,567,947

IMAGING SCREEN ASSEMBLY FOR IMAGE INTENSIFIER TUBE

Charles D. Robbing, Los Altos Hills, Calif., assignor to The Machlett Laboratories Incorporated, Springdale, Colo.

Filed Mar. 26, 1969, Ser. No. 810,458
Int. Cl. H01j *31/50*
U.S. Cl. 250—213 **9 Claims**

An image intensifier tube having an imaging screen assembly provided with means for preventing particles of imaging screen material and flakes of reflective coating material from being drawn electrostatically away from the imaging screen assembly, which means include an electrode comprising a layer of light-transmissive material disposed between the imaging screen and the output face plate of the tube.

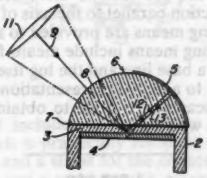


3,567,948

METHOD AND APPARATUS FOR IMPROVING THE QUANTUM EFFICIENCY OF PHOTOTUBES

John B. Oke, Altadena, and Rudolph E. Schild, South Pasadena, Calif., assignors to the United States of America, as represented by the Secretary of the Navy

Filed Apr. 14, 1969, Ser. No. 815,728
Int. Cl. H01j *39/12*
U.S. Cl. 250—216 **9 Claims**



An end-on photomultiplier tube has a fused quartz dome covering its light-receiving face plate or window and further has its photocathode interfaced with the window and with the tube vacuum. The dome is a partial hemisphere so shaped that, in combination with the window thickness, the two members form a true hemisphere centered on the cathode. An incident light beam passing through the dome and directed onto the cathode center is reflected back into the dome from both the inner and outer interfaces of the cathode. The exterior surface of the dome lying in the path of these reflected beams is aluminized and, since the radius of curvature of the dome is centered on the cathode, these reflected beams are normal to the aluminized surface and thus re-reflected and reimaged back onto the cathode center. The arrangement achieves quantum efficiency gains by permitting a multiple photon traversal of the cathode and by controlling the angle of incidence to promote maximum interface reflectance. Also the reduction in size of the effective photocathode area minimizes photomultiplier dark current.

3,567,949

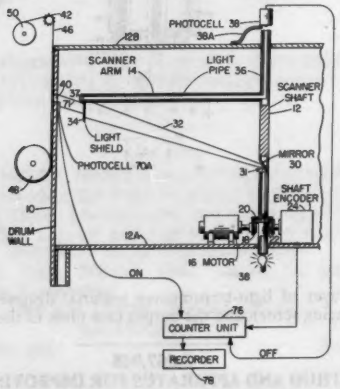
SYSTEM FOR CONVERTING WELL LOGS FROM ANALOGUE-TO-DIGITAL INFORMATION

James M. Forgotson, Jr., and Ralph H. Lindley, Tulsa, Okla., assignors to Pan American Petroleum Corporation, Tulsa, Okla.

Continuation of application Ser. No. 540,055, Apr. 4, 1966, now abandoned. This application May 12, 1969, Ser. No. 827,089

Int. Cl. G01n *21/30;* **G01v** *1/00;* **G08c** *5/00*

U.S. Cl. 250—219 **14 Claims**



Conventional well logs in the past have been recorded to a large extent in analogue form as a visual trace on a strip of paper. With the advent of the digital computer, it is now desired to convert these logs into digital form so that they can be processed in such modern computers. Such well logs are transferred to long strips of precision ruled, perforated paper. A drum with windows placed around its periphery is provided. Means are provided to drive these logs by these windows in a direction parallel to the axis of the drum. At the same time, scanning means are provided to scan by each window. These scanning means include means for measuring the distance between a base line and the log itself. This measurement is converted to a digital representation of the log at that point. Sufficient scanning is done to obtain digital information defining each well log.

3,567,950

DRAWING-TO-TAPE PROGRAMMER WITH PHOTOELECTRIC SCAN POSITION ENCODING

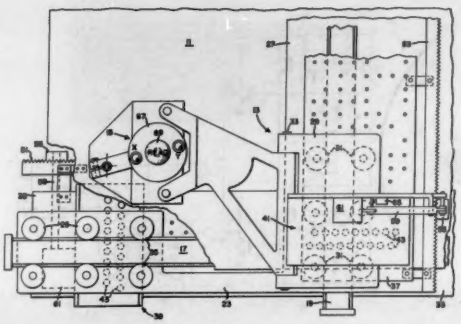
Heinrich Meyer, Liverpool, N.Y., assignor to General Electric Company

Filed Aug. 25, 1969, Ser. No. 852,699

Int. Cl. G08c *9/06;* **G01n** *21/30*

U.S. Cl. 250—219 **5 Claims**

Apparatus for translating position coordinates of points on a multidimensional display into binary information for recording in form suitable for use with numerical control equipment. More specifically, a drawing-to-tape programmer is described comprising a scanning assembly movable along orthogonally related coordinate axes into registration with each point to be recorded, the position coordinates of that point being encoded by photoelectric sensor arrays movable with the scanning assembly along binary coding scales each paralleling one of the coordinate axes and apertured to pass light to the associated photosensor array in a coded pattern providing unambiguous indication of the position coordinate along that axis. Rack and detent members with the rack teeth spaced correspondingly to the coding scale aperture spacing are provided for assuring alignment of the photosensor array with those coding scale apertures nearest to correspondence with the point to be translated, then locking the scanning assembly against further movement along that coordinate axis until read-out is completed. Means also are provided for marking each point as read, for preventing repeat of read-



out, and for limiting read-out information, to the minimum essential to define position coordinates newly changed.

3,567,951

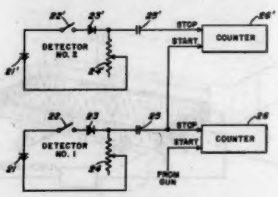
LASER PROJECTILE DETECTION SYSTEM

Hugh E. Montgomery, Jr., Knoxville, Tenn.; Conrad W. Brandts, Dahlgren, and Richard A. Frazer, King George, Va., assignors to the United States of America as represented by the Secretary of the Navy

Filed Apr. 14, 1969, Ser. No. 815,689

Int. Cl. G01p *3/68*

U.S. Cl. 250—222 **3 Claims**



The present invention is directed to a system which measures the ejection time and muzzle velocity of a gun. The system utilizes a laser whose beam is split and then directed across the projectile ejection path to two photodetectors. When the gun is triggered, a projectile is fired and a first counter is activated. When the projectile leaves the gun barrel it breaks the first light path between the laser and the first photodetector and turns off the first counter. Simultaneously, it initiates a second counter which is deactivated when the light path to the second photodetector is broken by the projectile.

3,567,952

PROCESS FOR ELECTRICAL POWER GENERATION AND WATER PURIFICATION SYSTEM

George D. Doland, 1103 Westgate Road, Mount Prospect, Ill.

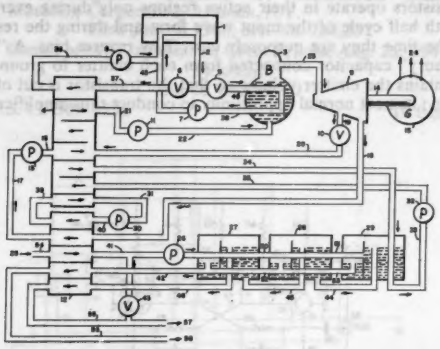
Filed Feb. 3, 1966, Ser. No. 527,393

Int. Cl. C02b *1/06*

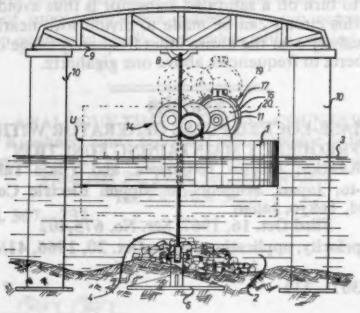
U.S. Cl. 290—1 **3 Claims**

The invention described herein relates to an improved water and power plant system. The system consists of a means for producing steam which is used for a steam turbine prime mover driving an electrical generator. Steam is extracted from the steam expansion cycle to operate the water plant. High efficiency is achieved by operating the turbine at pressures and temperatures similar to a power-only plant. Thermal economy for the water plant is gained by using the

exhaust steam of the turbine to preheat the water plant feed. Additional thermal economy is gained by recovering energy from the water plant discharged concentrated impure water and product water.



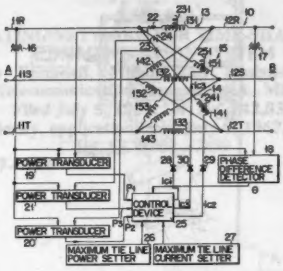
3,567,953
TIDE-OPERATED POWER PLANT
Bruno Lord, Lac Bellemare, St. Mathieu, Province of Quebec, Canada
Filed Mar. 10, 1969, Ser. No. 805,681
Int. Cl. F03b *13/12*
U.S. Cl. 290—42 **2 Claims**



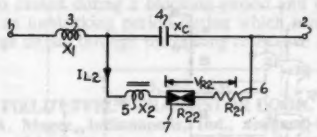
A tide-operated power plant consisting of an electric generator mounted on a float, a driving train for said generator, including a reverse and operated by a member stationary with respect to the water bottom, whereby up-and-down movement of the float will drive the generator.

3,567,954
INTERCONNECTING MEANS FOR ELECTRIC POWER SYSTEMS
Tsuneo Mitsui, and Muneyuki Udo, Tokyo, Japan, assignors to Tokyo Electric Power Co., Inc., Toyko, Japan and Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan
Filed Aug. 25, 1969, Ser. No. 852,821
Claims priority, application Japan, Aug. 28, 1968, 43/61270;43/61269
Int. Cl. B62d *55/14*
U.S. Cl. 307—20 **4 Claims**

An interconnecting means for AC electric power systems is composed of a plurality of DC excited saturable reactors located within a tie line connecting said electric power systems. These DC excited saturable reactors are arranged between the corresponding phase lines, as well as between the different phase lines, of the tie line. Thus in the normal state where there is little phase difference between the interconnected power systems, only the reactors disposed between the corresponding phase lines are reduced in impedance by regulating their DC excitation so as to allow sufficient power to flow therethrough. But under the stepout condition between said power systems, all the saturable reactors are controlled in DC excitation to have their impedance reduced in turn according to the degree of the phase difference between said interconnected power systems, whereby the tie line power flows across those phase lines of the tie line which have the smallest phase difference.



3,567,955
CIRCUITS FOR INTERCONNECTING ALTERNATING CURRENT NETWORKS
Hemesh Laxmidas Thanawala, Stretford, Manchester, England, assignor to Associated Electrical Industries Limited, London, England
Filed Oct. 3, 1966, Ser. No. 583,828
Int. Cl. H02j *1/10*
U.S. Cl. 307—51 **6 Claims**

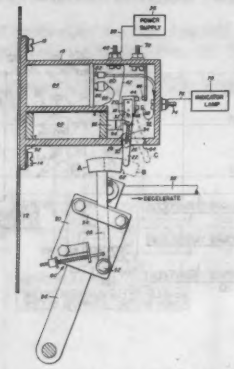


An AC circuit includes an inductance and capacitance combination which is practically resonant at a conventional power frequency and a shunt for the capacitance including a saturable reactor and a resistance. A means, which may, for example, comprise a nonlinear resistance included in the shunt connection, is included to provide a damping effect on circuit transients as well as to assist the recovery of the reactor.

3,567,956
AUTOMATIC DECELERATION WARNING SWITCH
Fred A. McNiel, 611 Bouldin Ave., Austin, Tex.
Filed May 13, 1969, Ser. No. 824,081
Int. Cl. H01h *35/00*
U.S. Cl. 307—121 **9 Claims**

The subject invention relates to a switching device which will be activated by the sudden release of an automotive accelerator pedal. A pendulum arm is secured to the accelerator linkage and will operate when the position of the linkage is suddenly changed, but will not operate when the position is changed at a normal speed. A switch unit enclosed in a casing has a clevice type switch arm which extends through the casing to engage the pendulum arm when the accelerator pedal is released suddenly thereby to close two pairs of contacts. Three circuits are completed by the closing of the contacts through which current from a power source causes the vehicle's stop lamp to illuminate, a signal lamp within the visual range of the vehicle driver to illuminate, and a flasher

unit to energize. The flasher unit, after a predetermined period of time, conveys current to an electromagnet secured



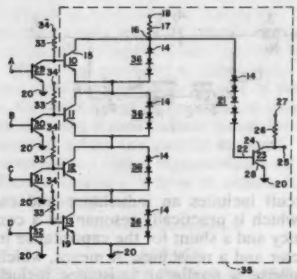
within the casing which causes the switch unit to reset, whereby the contacts are disengaged and the circuits are broken.

3,567,957

THRESHOLD LOGIC CIRCUITS UTILIZING SERIES CONNECTED TRANSISTORS AND LEVEL SHIFTING DIODES

Dwight W. Aten, Washington, N.J., assignor to The Singer Company, New York, N.Y.

Filed Mar. 25, 1969, Ser. No. 810,137
Int. Cl. H03k *19/42, 19/44, 5/08*
U.S. Cl. 307—211 **5 Claims**



A string of series-connected transistors having discrete inputs provides a variable clamping voltage to a common junction point by controlling the shunting of individual groups of diodes connected in series with the junction point and ground. An output transistor has its base connected through a series of level-shifting diodes to the common junction point to establish a threshold level. The number of level-shifting diodes is chosen so that when certain ones of the series-connected transistors are saturated, the clamping voltage goes below that necessary to bias the output transistor to conduction and it turns off producing a "1" at the output.

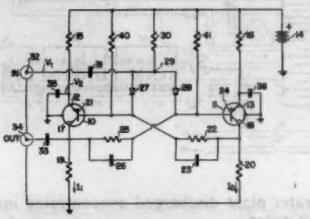
3,567,958

HIGH-SPEED TRANSISTOR BINARY FREQUENCY DIVIDER

Robert H. Bickley, Milford, Conn., assignor to The Singer Company, New York, N.Y.

Filed July 12, 1968, Ser. No. 744,533
Int. Cl. H03k *21/00*
U.S. Cl. 307—220 **4 Claims**

A circuit is disclosed in which a pair of collector-base cross-coupled transistors operating as intermittent amplifiers are adapted to operate conductively in their active regions only during alternate negative half cycles of an AC input signal and results in an output signal from either transistor having one-half the frequency of the input signal. The transistors operate in their active regions only during every fourth half cycle of the input wave form and during the rest of the time they are purposely cut off by reverse bias. A "memory" capacitor connected from each emitter to ground maintains the emitter voltage so that the transistor is cut off during its next normal opportunity to conduct thus amplification is prevented during alternate half cycles of input voltage. This capacitor also provides low AC emitter-to-ground impedance thus allowing transistor amplification of the input half wave when the transistor is not cut off. This circuit permits high-speed operation because the transistors are never operated in their saturated region and the time delay required to turn off a saturated transistor is thus avoided. As a result, this circuit can be made to divide with nearly constant sensitivity over the entire input frequency range of from 60 megahertz to frequencies above one gigahertz.

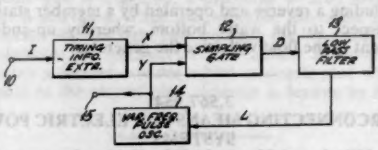


3,567,959

PHASE-LOCKED PULSE GENERATOR WITH FREQUENCY MAINTAINING FUNCTION

Hisashi Kaneko; Atsushi Tomozawa, and Yukio Takimoto, Tokyo-to, Japan, assignors to Nippon Electric Company Limited, Tokyo, Japan

Filed Oct. 16, 1967, Ser. No. 675,402
Claims priority, application Japan, Oct. 20, 1966, 41/69163
Int. Cl. H03k *5/20*
U.S. Cl. 307—232 **7 Claims**



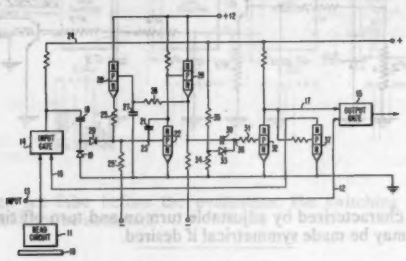
A phase-locked pulse generator for producing clock pulses for reception of digital signals including timing information of varying density and comprising a sampling type phase comparator and a low pass filter for temporarily holding, in the case of a reduction in the timing information density, the timing information detected by the phase comparator. Due to this holding action, the frequency of the pulse generator is controlled by the output of the low pass filter and is maintained substantially unchanged even when the timing information is not continually included in the digital signal.

3,567,960

GATING CIRCUIT FOR DISPLACED PULSES

Charles E. Owen and Christopher N. Wallis, Chandler's Ford, England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 4, 1968, Ser. No. 734,287
Claims priority, application Great Britain, Aug. 26, 1967, 39369/67
Int. Cl. H03k 5/20
U.S. Cl. 307—232 10 Claims



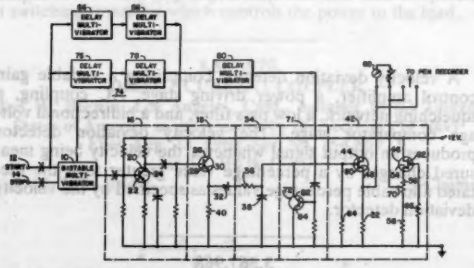
A gating circuit useful for separating data pulses from clock pulses in a double frequency detection system includes a signal generator that provides a sawtooth waveform having ramp portions of the same slope and a flyback interval of fixed magnitude. When the sawtooth signal is above a variable threshold, an input gate is enabled to allow the clock pulses to initiate flyback. The proportions of the sawtooth waveform above and below the threshold remain constant, so that early or late arrival of a clock pulse does not affect the gating of succeeding clock pulses. Thus, an output gate is made to operate to block clock pulses while passing data pulses.

3,567,961

ANALOGUE TIME INTERVAL COUNTER

Walter Koechner, Santa Monica, Calif., assignor to the United States of America as represented by the Secretary of Army

Filed July 31, 1968, Ser. No. 749,075
Int. Cl. H03r 5/20
U.S. Cl. 307—232 3 Claims



A system for producing an analogue voltage of the time interval between a start and stop pulse. The start pulse initiates circuitry for generating a charging voltage proportional to the time duration between a start and stop pulse, and the charging voltage is applied to a relatively slow response panel meter connected through a differential source follower amplifier consisting of two field effect transistors. The panel meter is connected across the respective source electrodes of the field effect transistors. If the time between two successive start pulses is smaller than the response time of the meter, pulse averaging takes place. If one assumes a response time of one second on the panel meter, then the displayed result represents the average value over n-range measurements where n is the pulse repetition rate of the system.

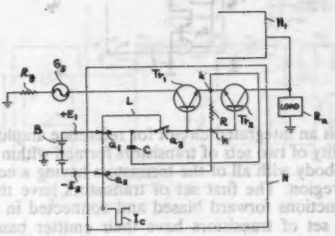
The invention described herein may be manufactured, used, and licensed by or for the Government for governmental purposes without the payment to me of any royalty thereon.

3,567,962

GATING NETWORK FOR TIME-SHARING COMMUNICATION SYSTEM

Ferdinando Formenti, Milan, Italy, assignor to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed July 5, 1968, Ser. No. 742,837
Claims priority, application Italy, July 6, 1967, 18,051A/67
Int. Cl. H03k 17/00
U.S. Cl. 307—246 10 Claims



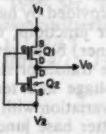
A signal patch including two transistors connected back-to-back is closed by the discharge of a condenser through a biasing resistance which is connected in parallel across the bases and the emitters of these transistors, preferably in series with a diode, the condenser having a charging circuit which is closed during a blocking period and which is open during an unblocking period during which a normally open discharge circuit through the biasing resistance is closed.

3,567,963

FIELD EFFECT TRANSISTOR LOGIC GATE

Gary A. Magee, Indianapolis, Ind., assignor to the United States of America as represented by the Secretary of Navy

Filed May 22, 1969, Ser. No. 826,968
Int. Cl. H03k 19/08
U.S. Cl. 307—205 5 Claims



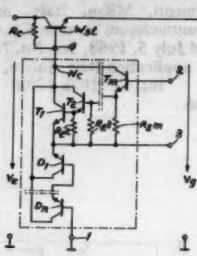
A field effect transistor logic gate having a pair of field effect transistors coupled through their source and drain terminals between information and timing input signals with the source terminal of each field effect transistor coupled to the gate terminal of the other field effect transistor and their drain terminals coupled in common as an output to gate through the information signal in time relation with the timing input signal on their respective source terminals, constituting an AND circuit which AND circuit is readily converted to a half-bit delay circuit by adding a field effect transistor serially in the output and gated by one of the input signals and which half-bits are readily paired and cascaded to 1-bit delay circuits and circulating memory logic circuits.

3,567,964

INTEGRATED CIRCUIT FOR REFERENCE AMPLIFIER

Hartmut Bleher, Fishkill, N.Y., assignor to International Standard Electric Corporation, New York, N.Y.

Filed Jan. 24, 1969, Ser. No. 793,782
Claims priority, application Germany, Jan. 27, 1968, P 16 38 010.2
Int. Cl. H01l 19/00
U.S. Cl. 307—303 1 Claim



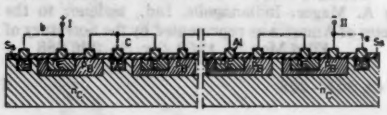
This is an integrated circuit for reference amplifiers having a plurality of two sets of transistors formed within a semiconductor body with all of the transistors having a common collector region. The first set of transistors have their emitter base junctions forward biased and connected in series. The second set of transistors have their emitter base junctions connected in series and reverse biased so as to operate as zener diodes.

3,567,965

TEMPERATURE COMPENSATED ZENER DIODE

Hans Weinerth, Eindhoven-Woensel, Netherlands, and Hartmut Bleher, Fishkill, N.Y., assignors to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 5, 1968, Ser. No. 781,358
Claims priority, application Germany, Dec. 9, 1967, 1,589,707
Int. Cl. H01l 17/00
U.S. Cl. 307—303 11 Claims



This is a temperature compensated zener diode wherein the compensation is provided by having a transistor structure with two base emitter junctions, one operating in forward bias and the other (zener) being reversed biased. This device has a number of these transistor structures cascaded to give the desired zener voltage and temperature compensation. The negative voltage variation with respect to temperature of a forward biased emitter base junction compensates for the positive voltage variation of the zener diode.

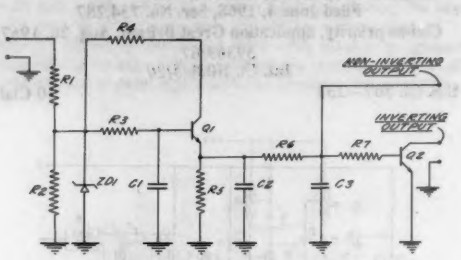
3,567,966

TRANSIENT SUPPRESSION CIRCUIT

Lyman F. Gilbert, Somers, and William W. Landon, Jr., Andover, Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 10, 1968, Ser. No. 720,060
Int. Cl. H03k 5/20
U.S. Cl. 307—234 7 Claims

Solid-state circuitry for coupling input signals of relatively long duration to a logic system, the circuitry comprising an integrator which, in response to input signals of the proper magnitude, duration and polarity, provides a ramp voltage to a level detector. Improved transient suppression is achieved by employing input signals to provide, after integration, the base and collector drive for an input transistor. The circuitry



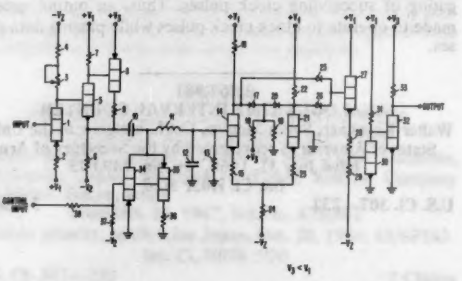
is also characterized by adjustable turn on and turn off times which may be made symmetrical if desired.

3,567,967

VELOCITY DEVIATION DETECTOR

Benjamin Carmel Fiorino, Longmont, and Juan Alfonso Rodriguez, Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 9, 1968, Ser. No. 727,810
Int. Cl. H03k 5/13
U.S. Cl. 307—235 2 Claims



A velocity deviation detector comprising a variable gain control amplifier, a power driving stage, AC coupling, a squelching network, a low pass filter, and a bidirectional voltage comparator stage. The velocity deviation detector produces an output signal whenever the velocity being measured changes by a percentage value greater than the dictated allowable percentage values as specified by the velocity deviation detector.

3,567,968

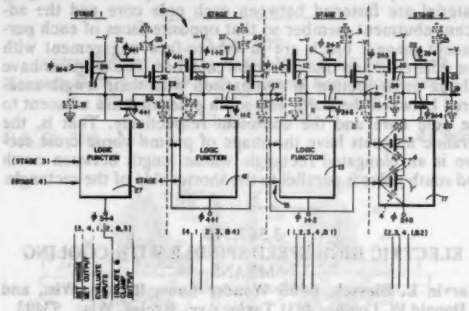
GATING SYSTEM FOR REDUCING THE EFFECTS OF POSITIVE FEEDBACK NOISE IN MULTIPHASE GATING DEVICES

Robert K. Booher, Downey, Calif., assignor to North American Rockwell Corporation

Filed Mar. 13, 1967, Ser. No. 622,578
Int. Cl. H03k 19/08, 17/00, 21/00
U.S. Cl. 307—251 2 Claims

A multiphase gating system which reduces the effects of positive noise normally present at the outputs of stages comprising prior art multiphase gating systems by providing switching means for clamping the outputs of particular stages previously set to a logical true level, to said level during the

periods that the stage of the outputs of particular stages are being evaluated as inputs to other stages. If the outputs had



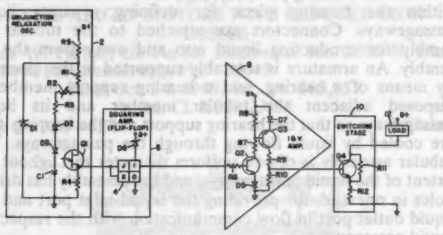
been set false before the evaluation, the switching means would not be actuated.

3,567,969

HIGH POWER MODULATOR

Johnny W. Goode, West Point, Miss.; Raymond A. Brandt, Huntsville, Ala., and The First National Bank of Huntsville, Administrator, assignors to the United States of America as represented by the Secretary of Army

Filed Aug. 6, 1968, Ser. No. 751,010
Int. Cl. H03k *17/00*
U.S. Cl. 307—253 3 Claims



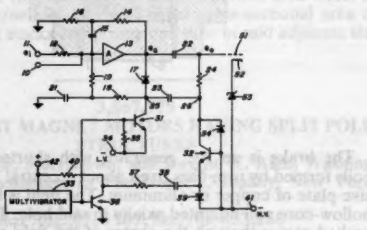
A device providing medium voltage, high current switching into a load with nonlinear characteristics. The square wave output of a clocked flip-flop is amplified and used to operate a switching transistor which controls the power to the load.

3,567,970

DIRECT CURRENT COUPLER

Ted W. Berwin, Los Angeles, Calif., assignor to the United States of America as represented by the Secretary of Navy

Filed Aug. 23, 1968, Ser. No. 754,867
Int. Cl. H03k *17/00*
U.S. Cl. 307—254 5 Claims



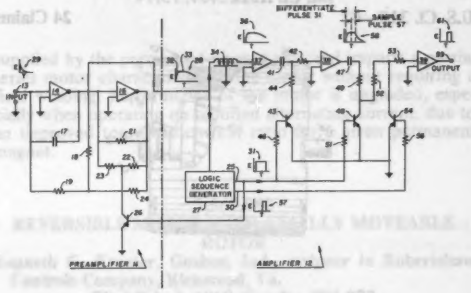
This invention is directed to a direct current coupling circuit which couples a voltage signal from one DC level to another. The circuit utilizes an operational amplifier and a resistive-capacitive network connected to the output of the amplifier. The shift in DC level is provided by a DC potential which is connected across one of the capacitors in the resistive-capacitive network. Connection of this potential is achieved by means of a high-speed switching circuit.

3,567,971

TIME-SAMPLING-PULSE AMPLIFIER

William W. Goldsworthy, Orinda, Calif., assignor to the United States of America as represented by the United States Atomic Energy Commission

Filed Sept. 27, 1968, Ser. No. 763,258
Int. Cl. H03k *1/18*
U.S. Cl. 307—267 7 Claims



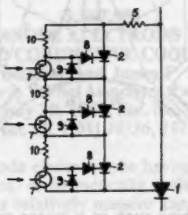
A pulse amplifier particularly designed for amplifying electrical pulses from charged particle detectors and normally having differentiation networks with a short time constant so that base line stability and immunity from low frequency "noise" is obtained. When an input pulse is detected, the time constant of the networks is increased for the duration of the pulse by increasing the resistance in the networks. The longer time constant provides accurate energy resolution by minimizing signal loss during a pulse. After the pulse amplitude has been sampled, the short time constant is restored and the baseline potential is rapidly obtained.

3,567,972

ARRANGEMENT FOR IGNITING SERIES CONNECTED POWER THYRISTORS BY MEANS OF AUXILIARY THYRISTOR CIRCUIT CONTROLLED BY LIGHT-SENSITIVE ELEMENTS

Werner Faust, Wettingen, Switzerland, assignor to Aktiengesellschaft Brown Boveri & Cie, Baden, Switzerland

Filed Sept. 18, 1968, Ser. No. 760,483
Claims priority, application Switzerland, Sept. 20, 1967, 13157/67
Int. Cl. H01l *9/12, 15/00*
U.S. Cl. 307—311 6 Claims



An arrangement for igniting each of a plurality of series connected power thyristors of a high voltage operating cir-

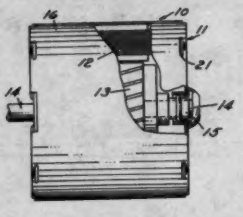
cuit comprises a plurality of auxiliary thyristors arranged in series and connected between the anode side of the power thyristor and its control electrode. The auxiliary thyristors require relatively small operating current for their ignition and the necessary ignition current is supplied by light-sensitive control elements connected to the control electrodes of the auxiliary transistors. The light-sensitive control elements can be of any suitable type such as photodiodes, phototransistors and photoresistors.

3,567,973

ELECTRIC MOTORS

Alfred Mastrodonato, Sr.; Kurt Porter, Owosso, and Robert R. Rhoads, Corunna, Mich., assignors to Universal Electric Company, Owosso, Mich.

Filed June 26, 1968, Ser. No. 740,338
Int. Cl. H02k *5/04, 15/14*
U.S. Cl. 310—42 24 Claims



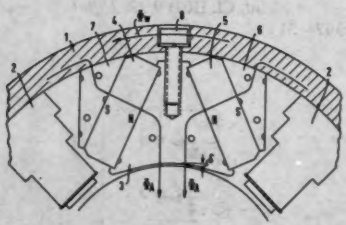
In one form the electric motor comprises an improved frame which rotatably supports the rotor shaft. This frame consists of a circular shell which encircles the stator and two end members which engage into the inside of the shell and contain a bearing for supporting an end of the shaft. The shell has a plurality of notches at each end for receiving mating projections on the end member, thus securing the end member against relative rotational movement. The shell also has a plurality of slots in each end which serve to define a portion of the shell which can be deformed radially inward after assembly of the end members to secure the end members against axial movement.

3,567,974

DYNAMOELECTRIC MACHINE WITH PERMANENT-MAGNET EXCITATION

Horst Spingler, Bad Neustadt Saale, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Filed Aug. 22, 1969, Ser. No. 852,298
Claims priority, application Germany, Aug. 28, 1968, 1,763,876
Int. Cl. H02k *37/00*
U.S. Cl. 310—46 6 Claims



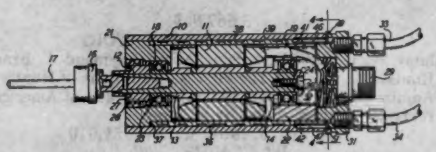
An electric machine such as a motor or generator is provided with wedge-shaped pole cores which are secured to the rotor or stator structure in radially spaced relation thereto so that an airgap remains between each pole core and the structure to which the core is attached. The cores are angularly spaced from each other and taper toward the stator or rotor structure to which they are fastened. Abutment members are also fastened to the same structure in angularly spaced relation to the pole cores. Ceramic blocks of permanent magnet material are fastened between each pole core and the adjacent abutment member so that opposite faces of each permanent magnet block are in face-to-face engagement with one pole core and one abutment member. The magnets have a large cross section in comparison with their length measured between the north and south poles that are adjacent to the pole core and the abutment respectively. That is, the ceramic magnets have the shape of prisms whose cross section is an elongated rectangle whose length between north and south poles is parallel to the shorter side of the rectangle.

3,567,975

ELECTRIC HIGH-SPEED SPINDLE WITH COOLING MEANS

Marvin L. Biesack, 6408 Wonder Lane, Racine, Wis., and Donald W. Loomis, 4931 Taylor Ave., Racine, Wis. 53403

Filed Dec. 12, 1969, Ser. No. 884,544
Int. Cl. H02k *9/19*
U.S. Cl. 310—54 4 Claims



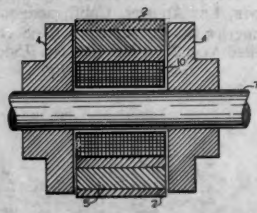
A tubular housing piece and a tubular member telescoped within the housing piece for defining separate liquid passageways. Connectors are attached to the tubular assembly for conducting liquid into and away from the assembly. An armature is rotatably supported in the assembly by means of a bearing, and a bearing support member is disposed adjacent the tubular member and its liquid passageways so that the bearing support and the bearing itself are cooled by liquid flowing through the passageways. The tubular assembly is of one uniform diameter throughout the extent of the liquid passageways, and the assembly has drilled holes in one end, for providing the liquid inlet port and the liquid outlet port in flow communication with the respective liquid passageways.

3,567,976

EDDY CURRENT BRAKES

Max Alth, 6 Tamarack Road, Port Chester, N.Y.

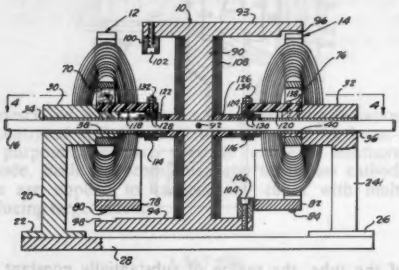
Filed July 15, 1969, Ser. No. 841,938
Int. Cl. H02k *49/04*
U.S. Cl. 310—93 5 Claims



The brake is an AC generator with shorted turn output coils formed by iron bars fixed about a central hole in a massive plate of copper or aluminum. The field is furnished by a hollow-core coil mounted axially in said hole. The shaft to be braked passes through the center of the field coil. Iron bars, mounted as a pair, on either side of the plate and coil are keyed to said shaft; they rotate with the shaft and sweep the magnetic field over said iron poles and surrounding conduc-

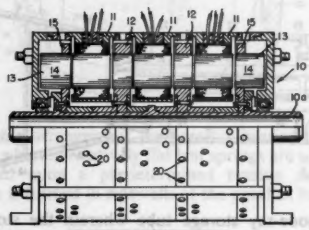
tive metal. Braking is controlled by varying field strength. No heavy currents are switched, no coils rotate and a single metal plate serves as the shorted secondaries and radiates generated heat.

3,567,977
ASYMMETICAL VOLTAGE WAVE GENERATOR
Kenneth H. McLean, 3915 W. Clement Road, Boise, Idaho
Filed Aug. 24, 1967, Ser. No. 662,987
Int. Cl. H02k *39/00*
U.S. Cl. 310—111 4 Claims



An electric motor or generator for producing AC by selective induction of magnetic flux through differential coupling of a flux path through a rotatable armature which moves adjacent stators which may be wound and connected such that the output taken from the stators comprises a series of pulses to provide an alternating current output.

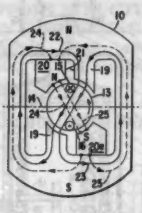
3,567,978
AXIAL AIRGAP MOTORS WITH REDUCED IRON LOSSES
Louis W. Parker, c/o Parker Electronics Inc. 2040 N. Dixie Hwy., Fort Lauderdale, Fla. 33305
Filed Oct. 24, 1969, Ser. No. 869,057
Int. Cl. H02k *23/60*
U.S. Cl. 310—124 8 Claims



An axial airgap motor is provided comprising two end rotors, a plurality of stators spaced from one another between said end rotors, and at least one further rotor positioned between the stators. Each end rotor includes a relatively massive magnetic ring having a radial length which is the same as the radial length of the pole pieces in the adjacent stator; and said magnetic ring has an axial cross-sectional area equal to substantially one-half the total radial cross-sectional area of the laminated stacks composing one pole in said adjacent stator.

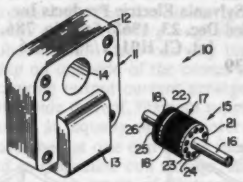
3,567,979
PERMANENT MAGNET MOTORS HAVING SPLIT POLE STRUCTURES
Wolfgang Jaffe, Morristown, and Dwight W. Aten, Washington, N.J., assignors to The Singer Company, New York, N.Y.
Filed Aug. 27, 1969, Ser. No. 853,260
Int. Cl. H02k *23/42*
U.S. Cl. 310—187 4 Claims

A permanent magnetic motor is disclosed in which each of the main poles is made up of two distinct parts. One part is a ceramic permanent magnet having very low permeability. The other part is made of soft steel of relatively high permeability. The armature reaction magnetomotive force (MMF) produces flux in the soft steel part related to the armature current and this flux is in a direction to add to the main flux



supplied by the permanent magnet part and imparts a partial series motor characteristic to the motor without requiring a field winding. Performance of the motor is upgraded, especially when operating on rectified alternating current, due to an improved torque to current ratio for a given permanent magnet.

3,567,980
REVERSIBLE MOTOR WITH AXIALLY MOVEABLE ROTOR
Kenneth G. Kreuter, Goshen, Ind., assignor to Robertshaw Controls Company, Richmond, Va.
Filed Feb. 3, 1969, Ser. No. 796,072
Int. Cl. H02k *7/12*
U.S. Cl. 310—209 8 Claims

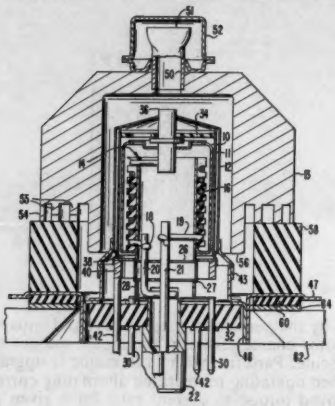


A reversible motor means having a stator provided with an opening means passing therethrough and receiving a rotor that is normally disposed in one position thereof that is in axially offset relation to the stator when the motor is deenergized, the rotor means having laminations thereon so constructed and arranged that when the motor means is energized, the rotor is pulled into centrally aligned relation with the stator and will remain in such centrally aligned relation even if, thereafter, the motor is reversed so as to drive the rotor in the opposite direction without causing the rotor to return to the one position thereof.

3,567,981
EXTERNAL ANODE ELECTRODE TUBE HAVING IMPROVED CONDUCTIVE COOLING MEANS
William H. Sain, Belmont, and James P. Polese, Menlo Park, Calif., assignors to Varian Associates, Palo Alto, Calif.
Filed July 30, 1968, Ser. No. 748,731
Int. Cl. H01j *19/36, 19/34*
U.S. Cl. 313—30 10 Claims

An external anode electron tube having improved conductive cooling means. A hermetically sealed tube envelope is disclosed having a relatively massive annular, generally cup-shaped metallic external anode having a plurality of spaced, annular projections, and a ceramic tubular envelop member hermetically sealed to the ends of the anode projections. An annular, metallic mounting flange is also disclosed having a plurality of spaced sections, each section having a surface

coplanar with a surface of each other section. A disc-shaped ceramic header is further disclosed positioned in spaced relation within the annular flange. The header has a plurality of terminal pins projecting therethrough.

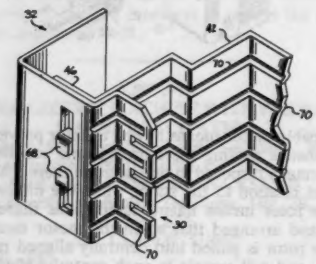


3,567,982

ELECTRON DISCHARGE DEVICE ANODE FIN HAVING HEAT DISTORTION PREVENTIVE MEANS INCORPORATED THEREIN

Cyril Droppa, and Charles C. Hendrickson, Emporium, Pa., assignors to Sylvania Electric Products Inc.

Filed Dec. 23, 1968, Ser. No. 786,185
Int. Cl. H01j *1/36, 19/36*
U.S. Cl. 313—39 **6 Claims**



Heat distortion preventive means in the form of expansion openings are provided in the leading edge of anode fins for increased stability during operation and longer life expectancy.

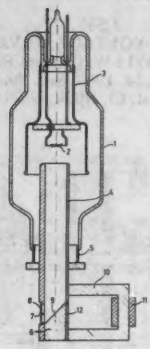
3,567,983

X-RAY TUBE WITH MAGNETIC FOCUSING MEANS

Gerhard Heinrich Friedrich de Vries, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 29, 1968, Ser. No. 733,020
Claims priority, application Netherlands, June 17, 1967, 6,708,463
Int. Cl. H01j *35/14, 35/18*
U.S. Cl. 313—57 **4 Claims**

An X-ray tube having a beryllium window in a metal wall portion of the tube which is integral with the anode, the beam channel extending in the axial direction of the tube at the window being surrounded by a strong magnetic field the lines of force of which extend substantially parallel to the axis of the tube, the region of substantially constant field strength on the side of the tube cross section closed by the window having a maximum width.

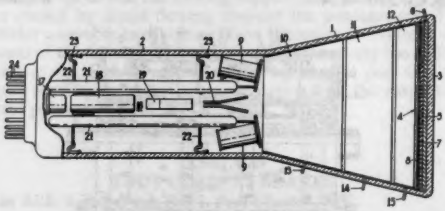


3,567,984

CATHODE-RAY STORAGE TUBE HAVING SEMICONTINUOUS PHOSPHOR LAYER ON CONTINUOUS ELECTRON BOMBARDMENT INDUCED CONDUCTIVITY LAYER

Lawrence Sidney Allard, Eastcote, Pinner, England, assignor to The M-O Valve Company Limited, London, England

Filed Apr. 22, 1968, Ser. No. 723,074
Claims priority, application Great Britain, Apr. 27, 1967, 19,456/67
Int. Cl. H01j *31/58, 31/62*
U.S. Cl. 313—68 **4 Claims**



A cathode-ray storage tube wherein the storage screen comprises an electrically conducting control layer overlaid with a layer of insulating material, having electron bombardment induced conductivity properties, which in turn is overlaid by a semicontinuous layer of charge-storage material. A writing gun bombards the insulating layer with electrons to produce localized paths of low conductivity between the charge-storage layer and the control layer, which is at a potential above the first crossover value of the secondary electron characteristic of the charge-storage material. Thereafter, electrons from a gun flooding the screen maintain a charge-storage pattern on the charge-storage layer by secondary electron emission at regions of the charge-storage layer corresponding to the localized conductive paths.

3,567,985

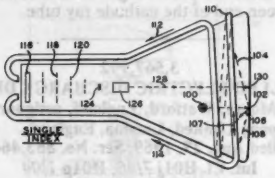
X-RAY AND ULTRAVIOLET DETECTORS FOR BEAM-INDEX AND HEATERLESS CATHODE RAY TUBES

David M. Goodman, 3834 Debra Court, Seaford, N.Y. 11783

Continuation of application Ser. No. 212,612, July 26, 1962. This application June 2, 1966, Ser. No. 562,031
Int. Cl. H01j *29/32, 29/34, 29/50*
U.S. Cl. 313—70 **11 Claims**

Beam-index and heaterless cathode ray tubes are depicted in combination with elongated and coiled light pipe-scintilla-

tors. Penetrating radiation which impinges upon the sidewalls of the elongated light pipe creates scintillations in the interior region thereof. These scintillations are in the optical frequency range and are accumulated in strength as they travel through the light pipe. They emerge at exit terminals of the light pipe in concentrated form. Target screens in the CRT



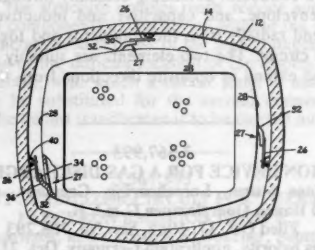
are described which provide the penetrating radiation. The concentrated optical scintillations are used for beam-indexing purposes; and are used to excite a nonthermionic cathode. Both the beam-index and heaterless cathode features are applied to cathode ray tubes with multicolor producing target screens.

3,567,986

CATHODE RAY TUBE SHADOW MASK SUPPORTING STRUCTURE HAVING STRAIGHT SPRINGS MOUNTED UPON STRUCK-OUT PORTIONS OF THE SHADOW MASK FRAME

Robert J. Bowes, Jr., and George R. Kautz, Seneca Falls, N.Y., assignors to Sylvania Electric Products, Inc.

Filed Nov. 12, 1968, Ser. No. 774,954
Int. Cl. H01j *1/53, 29/40*
U.S. Cl. 313—85 **2 Claims**



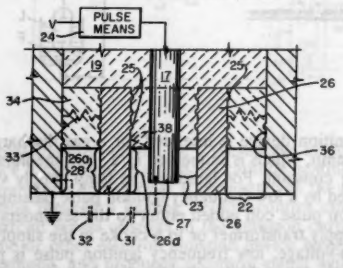
A mounting arrangement for parallax barriers for use in color tubes wherein relatively flat leaf springs are utilized and are mounted upon a predetermined tension determining plane which is formed in sidewalls of the parallax barrier support frame.

3,567,987

SPARK PLUG CONSTRUCTION

Gerald L. Schnurmacher, 319 Bonita Ave., Piedmont, Calif.

Filed June 6, 1968, Ser. No. 735,091
Int. Cl. H01t *13/02, 13/46*
U.S. Cl. 313—123 **4 Claims**



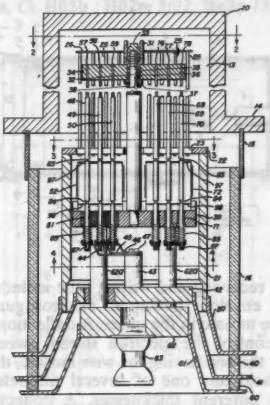
A spark plug construction of a type for use in a cylinder of an internal combustion engine includes a plurality of three concentric electrodes forming a pair of spark gaps. An annular resistance element encircles the intermediate electrode so as to discharge the capacitance defined between the intermediate and outer electrodes between successive firings of the gap therebetween.

3,567,988

FILAMENT SUPPORT STRUCTURE HAVING VIBRATION SUPPRESSING MEANS

Jacob A. Randmer, Wilton, Conn., and George J. Agule, Sandgate, Vt., assignors to The Machlett Laboratories, Incorporated, Springdale, Conn.

Filed Sept. 1, 1967, Ser. No. 665,091
Int. Cl. H01j *1/94, 19/48*
U.S. Cl. 313—278 **4 Claims**



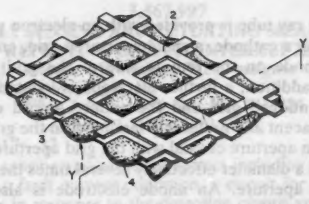
A cathode structure for electron discharge tubes comprising parallel filament wires extending longitudinally in an axial plane of the tube with all wires carrying input current arranged as a group on one side of the center of the structure and all wires carrying output current arranged as a second group on the other side thereof, filament support rods having peripheral grooves at equally spaced intervals along the length thereof attached at one end to the filament wires and at the other end to respective coil springs, and thin metallic frames surrounding each group of filament support rods in planes perpendicular thereto such that the ends of opposing cantilever arms attached to the frames engage the peripheral grooves of the support rods to restrain lateral movement thereof while permitting longitudinal movement to allow the coil springs to compensate for thermal elongation and contraction of the filament wires.

3,567,989

ELECTRON TUBE WITH MESH-TYPE CATHODE HAVING EMISSIVE PORTIONS BETWEEN CROSS STRIPS

Michio Koshizuka, and Hideo Uno, Tokyo, Japan, assignors to Japan Radio Company Limited, Tokyo, Japan

Filed Oct. 25, 1968, Ser. No. 770,560
Int. Cl. H01j *1/16, 19/10*
U.S. Cl. 313—310 **6 Claims**



A cathode structure of substantially uniform thickness exhibiting reduced heating time in an electron tube having a

mesh grid, the cathode comprising a mesh portion consisting of substantially flat cross-strips and a number of depressed portions formed between the cross-strips, the depressed portions being coated with an electronic emissive material.

3,567,990

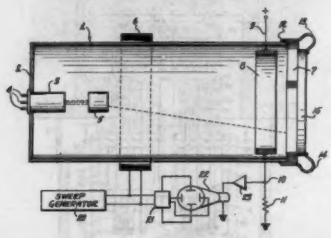
ULTRASONIC IMAGING APPARATUS

Roy R. Whymark, Rockville, Md., assignor to Tracor, Inc., Austin, Tex.

Continuation-in-part of application Ser. No. 679,075, Oct. 30, 1967, now abandoned. This application June 2, 1969, Ser. No. 834,200

Int. Cl. H01j *29/41*

U.S. Cl. 315—12 **11 Claims**



An imaging receiving and writing tube includes a cylindrical evacuated envelope having an electron gun in one end wall and a wire mosaic in the other. A deflection apparatus is provided to control the electron stream sweep. Clips are mounted near the end having the wire mosaic, the clips being designed to hold any one of several piezoelectric crystal plates having different thicknesses. A collector electrode contained within the envelope cooperates with the mosaic and transducer to provide image signals. The device can operate as a display or writing device with the transducer removed. In another embodiment the selected crystal plate is temporarily and removably adhered with a thin coating of silicone compound or the like.

3,567,991

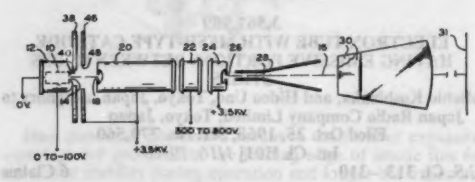
CATHODE RAY TUBE WITH IMPROVED ELECTRON GUN STRUCTURE

Conrad J. Odenthal, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 10, 1968, Ser. No. 720,035

Int. Cl. H01j *29/46*

U.S. Cl. 315—15 **13 Claims**



A cathode ray tube is provided with an electron gun structure including a cathode, a small apertured grid, and a small apertured anode on the remote side of the grid from the cathode. In addition, a further electrode is located between the aforementioned grid and the anode. A grid electrode, disposed adjacent and preferably mounted on the grid, is provided with an aperture coaxial with the grid aperture, but this aperture has a diameter effectively several times the diameter of the grid aperture. An anode electrode is also located between the grid and the aforementioned anode and is suitably connected to approximately the same voltage as the anode. The anode electrode is similarly provided with an aperture coaxial with the other apertures, but this aperture is also several times greater in diameter than the small aperture in the grid. The anode electrode acts to strengthen the electric field between such anode electrode and the grid whereby to provide a more concentrated electron beam. The region between the anode electrode and the anode provides a divergent lensing action for producing a small electron beam spot size at the screen end of the cathode ray tube.

3,567,992

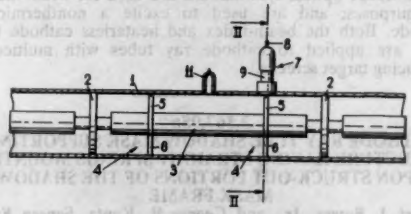
GAS-FILLED ELECTRIC DISCHARGE DEVICES

William Ives Moore, Watford, England, assignor to The M-O Valve Company Limited, London, England

Filed Aug. 27, 1969, Ser. No. 853,464

Int. Cl. H01j *7/46*; H01p *1/04*

U.S. Cl. 315—39 **7 Claims**



A gas-filled device for use in T-R and T-B cells which is of coaxial form and simple construction. The device essentially comprises a conductor extending coaxially through a tubular gas-filled envelope, and capacitive and inductive elements which extend radially from the conductor and together form a resonant circuit. The two elements are suitably formed integrally and extend in opposite directions from the conductor.

3,567,993

IGNITION DEVICE FOR A GAS-DISCHARGE LAMP

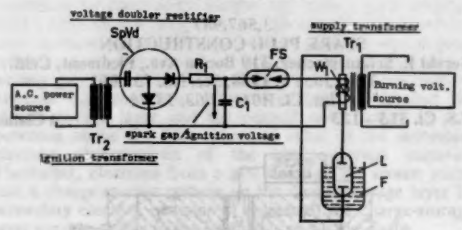
Walter Hans Sturm, Laerchenring, Germany, assignor to Original Hanau Quarzlampen G.m.b.H.

Filed Oct. 17, 1968, Ser. No. 768,293

Claims priority, application Germany, Oct. 21, 1967, 1,589,281

Int. Cl. H05b *41/16, 41/30*

U.S. Cl. 315—171 **11 Claims**



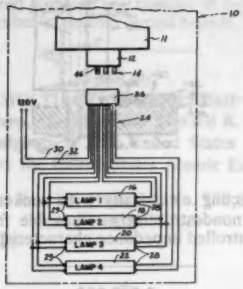
The ignition device is intended for a gas discharge lamp, i.e. arc lamp, which is immersed in a fluid medium of high dielectric constant. For ignition, the lamp supply voltage is augmented by a low-frequency ignition pulse passing through an ignition pulse coil added either to the secondary winding of the supply transformer or to a choke in the supply circuit. The high-voltage, low frequency ignition pulse is produced by a spark gap circuit, whereby the high-frequency components of the discharge voltage are filtered out by the inductance of the ignition pulse coil.

3,567,994

ILLUMINATIVE DISPLAY DEVICE

Harry Weiss, 205 West End Ave., New York, N.Y. 10013

Filed July 2, 1969, Ser. No. 838,451
Int. Cl. H05b 41/16
U.S. Cl. 315—276 12 Claims



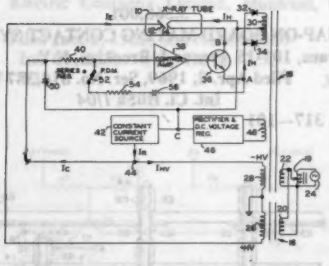
An illuminative display device for use in advertising comprises a ballast which includes a transformer, a first connector having terminals which are connected to the ballast transformer input and output windings, and a second connector having terminals connected to a group of lamps which are included in the device and are illuminated during the operation of the device. Two additional terminals on the second connector are connected to a voltage supply source. When the first and second connectors are joined, the source voltage is brought directly to the input terminals of the transformer, and the output terminals of the transformer are connected to the lamps. The structure enables ready service and repair of the various components in the device without the difficulties generally encountered because of the high voltages produced and because of the difficult location of the display device. A third connector, with which a ballast tester is associated, is adapted to be substituted for the second connector when testing of the ballast transformer is to be carried out.

3,567,995

CURRENT STABILIZER CIRCUIT FOR THERMIONIC ELECTRON EMISSION DEVICE

Peter O. Lauritzen, and Cormack E. Boucher, Seattle, Wash., assignors to Automation Industries, Inc., Los Angeles, Calif.

Filed Aug. 12, 1968, Ser. No. 751,927
Int. Cl. H05g 1/34
U.S. Cl. 315—311 2 Claims



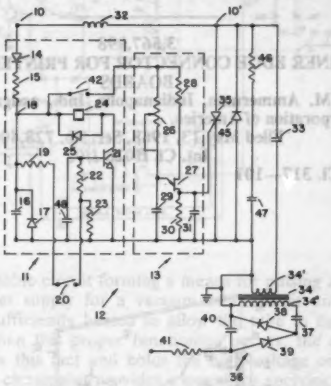
A current stabilizer circuit for a thermionic electron emission device is described in which the cathode heating winding of a power supply transformer is connected to the high-voltage winding through a heating current control circuit. The control circuit senses changes in the emission current of an X-ray tube or other electron emission device having a thermionic cathode, and produces a control signal which is applied to a variable impedance means connected in series with the cathode filament to vary the heating current in order to maintain such emission current substantially constant. The control circuit may operate by series regulation or by pulse duration modulation of the cathode heating current to change the average heating current and temperature of the cathode and thereby vary its electron emission in order to stabilize the emission current in spite of changes in the power supply voltage which tend to vary such emission current.

3,567,996

REGULATED HIGH VOLTAGE, DIRECT CURRENT POWER SUPPLY USEABLE WITH AN ELECTROSTATIC COATING DEVICE

George G. Gordon, and David G. Jessup, Indianapolis, Ind., assignors to Ransburg Electric-Coating Corp., Indianapolis, Ind.

Filed Jan. 2, 1969, Ser. No. 788,598
Int. Cl. H05b ; H02m 3/22; Ho2p 13/24
U.S. Cl. 317—3 15 Claims



A high voltage, low current power supply including a trigger circuit which converts direct current to a plurality of pulses. A semiconductor switch is biased to conduction by the application of pulses thereto by the trigger circuit. A capacitor is charged by a source when the semiconductor switch is nonconducting and is discharged when the semiconductor switch is conducting. A transformer converts the energy discharged by the capacitor to a high voltage.

A method for converting a low voltage input signal of either direct current or alternating current to a high voltage output signal.

3,567,997

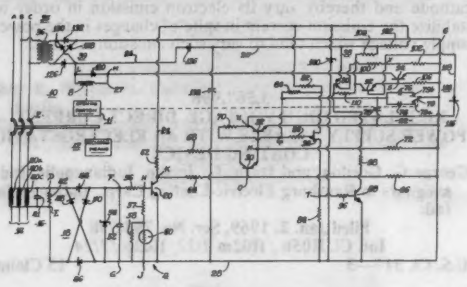
FAULT SENSING AND ACTUATING MEANS FOR REPEATING CIRCUIT INTERRUPTER

Richard J. Moran, Milwaukee, Wis., assignor to McGraw-Edison Company, Elgin, Ill.

Filed July 1, 1968, Ser. No. 741,781
Int. Cl. H02h 5/00, 3/08
U.S. Cl. 317—22 7 Claims

A fault sensing and actuating system including a circuit for detecting a fault current condition, a circuit for providing a time delay in response to the detecting circuit and then supplying a triggering pulse and an actuating circuit initially energized by the triggering pulse and subsequently self-main-

tained in an energized condition. The actuating circuit causes an opening operation of a repeating circuit interrupter and is



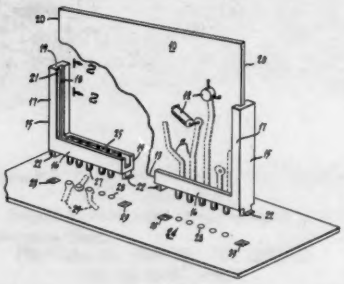
deenergized in response to the detecting circuit when the fault current condition is no longer detected.

3,567,998

CORNER EDGE CONNECTOR FOR PRINTED CIRCUIT BOARDS

John M. Ammerman, Indianapolis, Ind., assignor to Radio Corporation of America.

Filed May 13, 1968, Ser. No. 728,406
Int. Cl. H02b 1/02
U.S. Cl. 317—101 **4 Claims**



Disclosed is an L-shaped edge connector for the use with circuit modules such as printed circuit boards. The inner L-shaped surface of the connector is formed with a slotted channel adapted to receive the leading edge of the board in its base portion. The base of the connector is further fitted with spring contacts for securing and making electrical contact with the leading edge of the board. The slotted channel within the upright portion of the connector is adapted to receive an adjacent edge of the board and provide lateral support thereto.

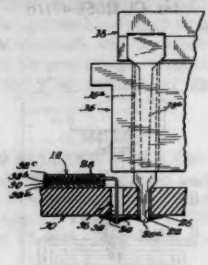
3,567,999

INTEGRATED CIRCUIT PANEL

Richard L. Larson; George C. Wright, Barrington, and Robert J. Drenning, Chicago, Ill., assignors to Methode Electronics, Inc., Chicago, Ill.

Filed Sept. 30, 1968, Ser. No. 763,805
Int. Cl. H05k 1/04
U.S. Cl. 317—101 **7 Claims**

A microelectronic panel comprising a printed circuit board with etched circuits and a multilayer, multiterminal laminar bus bar system mechanically attached to the board and electrically connected with the etched circuits, with said etched



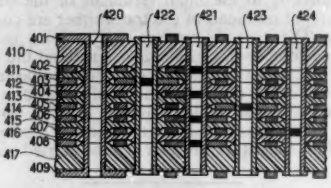
circuits connecting electrically with sockets, said bussing system being nondestructively removable from said board and having controlled impedance characteristics.

3,568,000

MULTILAYER PRINTED CIRCUIT

Francois Regis D'Aboville, Versailles; Jean-Francois Martre and Claude Cherdo, Saint-Michel-sur-Orge, France, assignors to Compagnie Generale D'Electricite, Paris, France

Filed Nov. 21, 1968, Ser. No. 777,560
Claims priority, application France, Nov. 22, 1967, 129,286
Int. Cl. H05k 1/04
U.S. Cl. 317—101 **2 Claims**



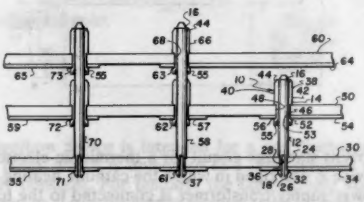
Multilayer printed circuit for signals whose rise time is less than one nanosecond. The conductive layers are stacked in the following order starting at any of the outer faces: connecting layer, ground layer, supply layer, ground layer. Thus, connections may be made by means of fixed-impedance microstrip lines and supply by means of very low impedance strip lines (less than a fraction of 1 ohm).

3,568,001

SNAP-ON BOARD MATING CONTACT SYSTEM

Sam Straus, 101-15 Avenue J, Brooklyn, N.Y.

Filed Apr. 8, 1969, Ser. No. 814,387
Int. Cl. H05k 1/04
U.S. Cl. 317—101 **4 Claims**



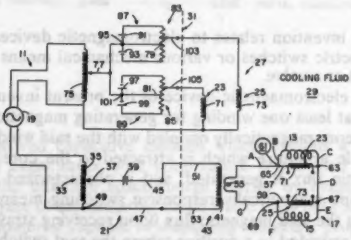
A miniature snap-on board mating contact system operable for connecting two or more circuit boards in a parallel arrangement in one push-on action or for disconnecting them in one pulloff action and wherein a male contact of one cir-

cuit board connects a predetermined number of female contacts of other circuit boards to electrically interconnect points in a predetermined number of electronic circuits on a predetermined number of circuit boards, each contact assembly includes a male contact or pin of a predetermined length that extends to or through a desired predetermined number of female contacts or sockets for connecting any number of desired points in any number of desired electronic circuits of a number of desired circuit boards.

3,568,002
MULTIACTION FLUX PUMP

Kenneth E. Robins, Moriches, and Richard B. Britton, Setauket, N.Y., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Nov. 18, 1968, Ser. No. 776,658
Int. Cl. H01h *47/00*
U.S. Cl. 317—123 **3 Claims**

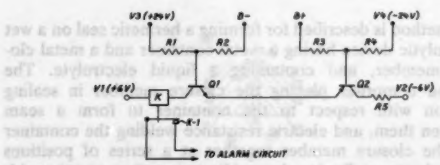


System for efficiently and quickly energizing superconducting magnet coils with direct current from an inexpensive, alternating current power supply by multiaction flux pumping, wherein continuously superconducting switching, and air core transformer coils are used to convert alternating current into a substantially continuously increasing direct current in the magnet coils while substantially preventing the dumping of large amounts of energy into the cryogenic cooling fluid for maintaining the magnet coils in their superconducting state whereby high magnetic fields are efficiently produced and/or maintained in the magnet coils.

3,568,003
VOLTAGE MONITORING CIRCUIT AND METHOD

John Arthur Pavie, Ottawa, Ontario, Canada, assignor to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed Jan. 2, 1968, Ser. No. 695,147
Int. Cl. H03k *17/60;* **H01h** *47/32*
U.S. Cl. 317—135 **3 Claims**

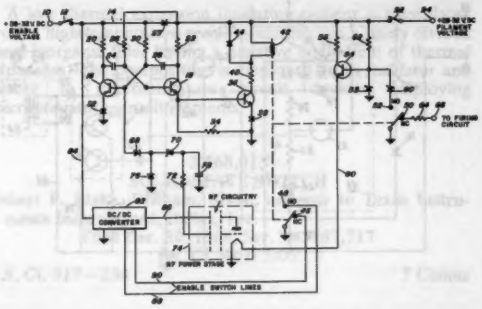


A PNP and an NPN transistor have their emitters connected. Four potentials to be monitored are connected with appropriate resistances to apply to the two collectors and to the two bases potentials so arranged that conduction will take place through the transistors when all potentials are functioning and no conduction will take place if any one of the potentials fail. An indicator is connected to indicate whether the transistors are conducting or not and this indicator therefore monitors the four potentials. Three voltages instead of four may be monitored with the fourth potential then necessary for causing conduction in the transistors being synthesized from two of the other three or independently supplied.

3,568,004
DELAY ENABLE CIRCUIT

Stephen D. Parker, Richmond, Ind., assignor to The United States of America as represented by the Secretary of the Navy

Filed Oct. 22, 1969, Ser. No. 868,539
Int. Cl. H02h *7/20*
U.S. Cl. 317—141 **8 Claims**

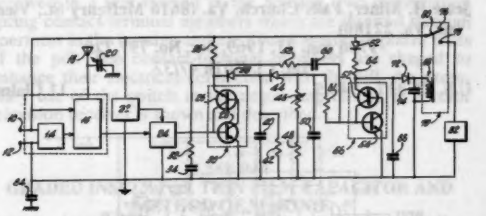


A delay enable circuit forming a means for pulsing a high-voltage power supply for a vacuum tube circuit until the cathode is sufficiently heated to allow the tube to function properly. When this proper functioning occurs, the enable circuit senses this fact and holds the high voltage on. The delay enable circuit also provides a means for applying an increased heater voltage to the tube during the warmup period, and cutting this voltage back to normal when the tube functions properly. This increased filament voltage provides a shorter warmup time without otherwise affecting the tube operation.

3,568,005
CONTROL CIRCUIT

Carl E. Atkins, Montclair, N.J., assignor to Wagner Electric Corporation

Filed July 5, 1968, Ser. No. 742,912
Int. Cl. H01h *47/22, 47/32*
U.S. Cl. 317—142 **8 Claims**



A first solid state switch normally shunts charging current past a timing circuit which controls the state of a second solid-state switch which normally shunts the winding of a load-controlling relay. When the input signal to the gate electrode of the first switch is altered so as to permit a bias circuit to render the first switch nonconductive, circuitry interconnecting the gate electrodes of the first and second switches causes the second switch to become nonconductive

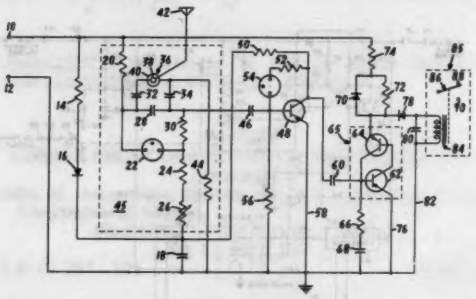
substantially concurrently with the first switch. Charging current, no longer shunted past the timing circuit, develops a voltage across a timing capacitor connected to the gate electrode of the second switch. Thus, when the first switch again becomes conductive, the second switch will remain nonconductive for an additional predetermined length of time during the discharge of the capacitor, thus prolonging the energization of the load circuit.

3,568,006

CAPACITANCE RESPONSIVE CIRCUIT

Carl E. Atkins, Montclair, N.J., assignor to Wagner Electric Corporation

Filed Jan. 4, 1968, Ser. No. 695,708
Int. Cl. H01h *47/22;* **H03k** *3/37*
U.S. Cl. 317—146 **9 Claims**



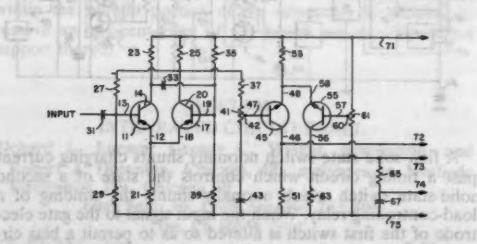
The invention provides a capacitance-responsive circuit for controlling a relay. The circuit includes a relaxation oscillator having a neon tube, a transistor amplifier also having a neon tube, a semiconductor switch and a relay. The relaxation oscillator is operated by a combination of AC and DC power inputs whereby the neon tube of the oscillator conducts relatively early in each negative half-cycle and the magnitude of the initial output pulse of the oscillator, in each pulse train generated in each negative half-cycle, is increased. The oscillator output is fed as input to the transistor amplifier and the neon tube thereof regulates the bias voltage of the transistor, protects the transistor from excessive junction voltage and stabilizes the tube of the oscillator by illuminating it. The semiconductor switch controls a shunt path for the winding of the relay, and the shunt path includes a diode and a first resistor connected in parallel with each other and in series with a second resistor, whereby heat generated is less than with the second resistor alone.

3,568,007

FILTER AND SUBSTITUTE FOR RESONANT REED RELAY

Jesse H. Miner, Falls Church, Va. (8616 McHenry St., Vienna, Va. 22180)

Filed Jan. 21, 1969, Ser. No. 797,720
Int. Cl. H01h *47/32*
U.S. Cl. 317—148.5 **11 Claims**



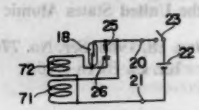
A monostable multivibrator is connected to a differential amplifier to perform the following functions: signal limiter, band-pass filter, low-pass filter, high-pass filter and frequency modulation detector.

3,568,008

ELECTROMAGNETIC SWITCHING DEVICE UTILIZING STRAY MAGNETIC FLUX

Shigeru Tanimura, Fushimi-ku, and Kenzo Kamei, Inuyama, Japan, assignors to Omron Tateisi Electronic Co., Ukyo-ku, Kyoto, Japan

Filed Apr. 25, 1969, Ser. No. 819,281
Claims priority, application Japan, Apr. 25, 1968, 43-28096
Int. Cl. H01h *47/04*
U.S. Cl. 317—154 **10 Claims**



This invention relates to electromagnetic devices for driving electric switches or various mechanical means such as a ratchet or a valve.

The electromagnetic device of the present invention comprises at least one winding for generating magnetic flux, one stator core magnetically coupled with the said winding, and a movable armature which is attracted to the core when the magnetic flux is generated; and is characterized in that at least one magnetically responsive switching means for controlling the said magnetic flux upon receiving stray magnetic flux is provided in a position where the said switching means receives the stray magnetic flux developed by existence of a gap or gaps between the armature and the stator core.

The electromagnetic device of the present invention can be made considerably smaller in size as well as requiring a smaller driving current than conventional devices, and has higher reliability. A delayed set operation is easily obtainable in the electromagnetic device of this invention.

3,568,009

HERMETICALLY SEALED ELECTROLYTIC DEVICE

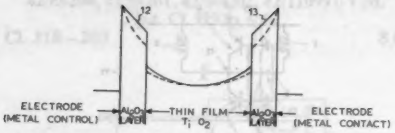
Bernard Rappaport, Los Angeles, Calif., assignor to Fansteel Inc.

Filed July 26, 1968, Ser. No. 747,992
Int. Cl. H01g *9/10*
U.S. Cl. 317—230 **4 Claims**

A method is described for forming a hermetic seal on a wet electrolytic device having a metal container and a metal closure member, and containing a liquid electrolyte. The method comprises placing the closure member in sealing position with respect to the container to form a seam between them, and electric resistance welding the container and the closure member together at a series of positions along the seam. During the welding operation at each welding position, the closure member and the container are pressed together at the portion of the seam being welded and that portion is bathed in a fluid, preferably the electrolyte used in the device, to provide uniform electrical conditions to the weld area. Typically, the container and closure member are made of tantalum. Also disclosed is a hermetically sealed electrolytic device of the type described above which is reduced in internal pressure at room temperature to

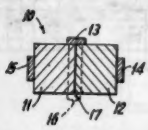
permit the liquid electrolyte to expand upon heating of the device with less pressure buildup.

3,568,010
THIN FILM CAPACITIVE BOLOMETER AND TEMPERATURE SENSOR
Joseph Maserjian, Sunland, Calif., assignor to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration
Filed Feb. 14, 1969, Ser. No. 799,353
Int. Cl. H01l *7/00*
U.S. Cl. 317—230 27 Claims



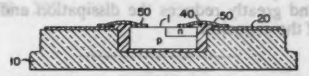
An improved capacitive element which exhibits a useful change of capacitance with temperature is provided by increasing the effective space-charge barrier by evaporating thinner layers of an insulating metal oxide over both sides of a film of material capable of displaying dielectric properties disposed between two metal electrodes, or by employing a thicker film of anodized metal oxide which contains less ionic space charge than the corresponding film of material used in the first technique. Thermal and mechanical characteristics of devices of this type are optimized by providing a substrate of a metal first evaporated on a glass slide to form a thin foil. Once the foil has been bonded over holes on a supporting frame, the glass slide is removed, leaving a smooth surface to form the devices on. That surface may be anodized, and once the devices are formed over holes, the unanodized thickness of the foil may be etched off through the holes in the frame leaving devices supported by an anodized film of the foil material.

3,568,011
SEMICONDUCTOR DEVICE INCLUDING A METAL LAYER OVERLYING THE JUNCTION AREA
Minetaka Iwasa, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan
Filed May 28, 1968, Ser. No. 732,627
Int. Cl. H01l *9/00*
U.S. Cl. 317—234 4 Claims



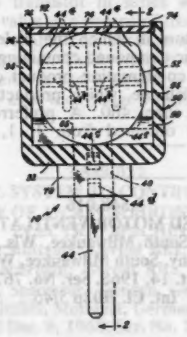
A high speed high current switching device is described wherein a metal-to-semiconductor rectifier element is selectively placed within the sphere of influence of a spatially variable space charge region of a semiconductor junction formed between semiconductor materials of opposite conductivity. Several embodiments are described.

3,568,012
A MICROMINIATURE CIRCUIT DEVICE EMPLOYING A LOW THERMAL EXPANSION BINDER
Wentworth A. Ernst, Catonsville, and Charles W. Wyble, Baltimore, Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Continuation-in-part of application Ser. No. 706,398, Feb. 19, 1968, now abandoned. This application Nov. 5, 1968, Ser. No. 773,586
Int. Cl. H01l *1/10*
U.S. Cl. 317—234 5 Claims



A low thermal expansion insulating cement is formulated from a high temperature resinous varnish and a finely divided inert inorganic filler having a negative coefficient of thermal expansion. The composition is employed as an insulator and binder in microminiature circuit devices employing microminiature circuit elements.

3,568,013
SOLID-STATE SWITCH
Robert F. Blaha, Dedham, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Dec. 30, 1968, Ser. No. 787,717
Int. Cl. H01l *5/00*
U.S. Cl. 317—234 7 Claims

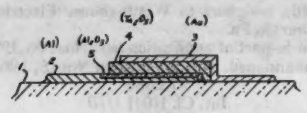


A low-cost degaussing switch having no moving parts comprising an open-ended, molded cup-shaped housing, an enclosing cover member, a pill of semiconductor material received in a seat formed in the housing, two combination spring contact-terminal members which are inserted through apertures in the housing and are biased against opposite faces of the pill. The contact-terminal members are shaped to enhance their electrical connection with the pill. An exemplary use of the switch in the degaussing circuit of a color television receiver is shown and described.

3,568,014
GRADED INSULATOR THIN FILM CAPACITOR AND METHOD OF MAKING
Fritz L. Schuermeyer, 325 W. Center College St., Yellow Springs, Ohio
Filed June 9, 1969, Ser. No. 831,447
Int. Cl. H01g *3/75*
U.S. Cl. 317—258 2 Claims

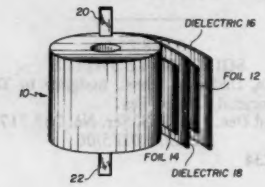
A thin film capacitor suitable for microelectronic circuit applications using aluminum as one electrode and any suitable metal, such as gold, as the other electrode. The dielectric is a metallic oxide of high dielectric constant, such as Ta_2O_5, contacted directly by the gold electrode but having a thin

film of Al_2O_3 interposed between it and the aluminum electrode. The relatively high barrier of the Al-Al_2O_3 interface



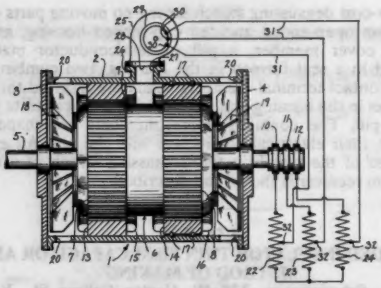
prevents the injection of electrons from the metal into the dielectric and greatly reduces the dissipation and rectifying tendency of the capacitor.

3,568,015
CAPACITOR WITH EPOXY SCAVENGER
Edward Mortin Lobo, New Bedford, Mass., assignor to Cornell-Dubilier Electric Corporation, Newark, N.J.
Filed Feb. 12, 1969, Ser. No. 798,699
Int. Cl. H01g *3/195*
U.S. Cl. 317—259 **8 Claims**



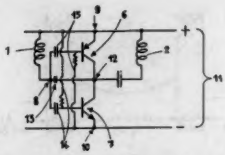
Electrical capacitors in which the dielectric liquid is halogenated aromatic compound containing as a scavenger a small amount of a condensation product of epichlorhydrin and a tetraphenylolalkane, which product has an epoxide equivalent of less than 400. A preferred condensation product is a resin obtained from 1, 1, 2, 2-tetraphenylolethane.

3,568,016
VARIABLE SPEED MOTOR VENTILATION SYSTEM
Donald E. Barber, South Milwaukee, Wis., assignor to Bucyrus-Erie Company, South Milwaukee, Wis.
Filed Oct. 14, 1968, Ser. No. 767,285
Int. Cl. H02p *5/46*
U.S. Cl. 318—78 **4 Claims**



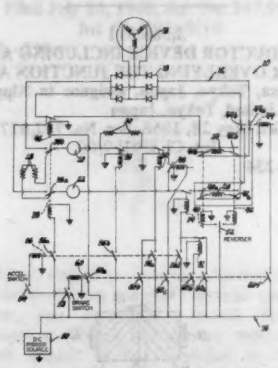
A ventilating system for an alternating current wound rotor induction motor having resistors in the secondary circuit of the rotor, in which a cooling fan driven by an auxiliary motor is provided for circulating air through the induction motor. The auxiliary fan motor is energized through connections with the resistors in the rotor secondary circuit, and the speed of the fan motor is dependent upon the frequency or voltage appearing at the connections with the resistors, whereby fan motor speed will increase whenever the wound rotor induction motor speed decreases to ensure an adequate flow of cooling air.

3,568,017
PUSH-PULL OSCILLATOR FOR SUSTAINING THE OSCILLATIONS OF A RESONATOR
Jean Schaad, Gorgier, Switzerland, assignor to Voumard Machines Co. S. A., La Chaux-De-Fonds, Neuchatel, Switzerland
Filed Aug. 4, 1969, Ser. No. 847,123
Int. Cl. H02k *33/10*
U.S. Cl. 318—128 **5 Claims**



An electronic device for sustaining the oscillations of a resonator, especially for a timepiece, characterized by the fact that it comprises two complementary transistors the emitters of which are connected to the terminals of a source of current, the bases of which are both connected to one source of control pulses producing pulses alternatively of one sign and of the other, and the collectors of which are both connected to the element to be controlled, wherefore these transistors are operated alternatively by the pulses, one by the pulses of one sign and the other by the pulses of opposite sign, and so that the resonator thus receives a sustaining pulse at each half-oscillation of its oscillating member.

3,568,018
ELECTRIC DRIVE AND BRAKE ARRANGEMENT AND METHOD
Norman L. Macdonald, Chicago, Ill., assignor to General Motors Corporation, Detroit, Mich.
Filed June 6, 1969, Ser. No. 831,121
Int. Cl. H02p *5/22, 3/24*
U.S. Cl. 318—151 **8 Claims**



An electric drive and dynamic braking arrangement intended in a preferred embodiment for driving and braking a vehicle, such as a heavy off-road truck, and having a pair of traction motors arranged to be driven by DC current obtained by rectifying the output of an AC generator, so as to drive the vehicle. Braking is also provided by the traction motors by separately exciting their fields with the generator output and dissipating the current generated in the traction motor armatures in resistance grids connected in series with the armatures. Rapid changeover from the power mode to

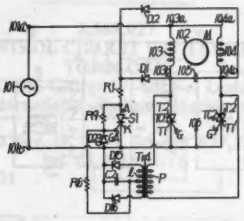
the brake mode is provided by an arrangement which momentarily short-circuits the generator at the beginning of the brake mode connection to quickly reduce the residual generator voltage to a value sufficiently low to avoid overexciting the traction motors so as to prevent consequent possible damage to them.

3,568,019

CIRCUIT FOR BRAKING AND DRIVING AN AC MOTOR IN THE FORWARD AND REVERSE DIRECTION UTILIZING SEMICONDUCTOR ELEMENTS

Yoichi Hirokawa, Kanagawa-ken, and Isao Masuzawa, Tokyo, Japan, assignors to Kabushikikaisha Tokyo Keiki Seizosho, Tokyo, Japan

Filed Dec. 24, 1968, Ser. No. 786,563
Claims priority, application Japan, Dec. 30, 1967, 42/85200, 42/85201, 42/80,202, 42/110991-V.M.
Int. Cl. H02p *1/40*
U.S. Cl. 318—203 8 Claims



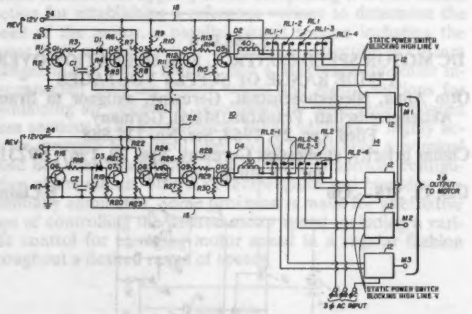
A controlling circuit for an AC motor having an AC motor, an AC electric power source for driving said AC motor, AC controlling elements connected between said AC power source and AC motor, a switching element connected between said AC motor and AC power source, a first means for detecting a condition of said AC controlling elements, and a second means for controlling said switching element in accordance with the result detected by said first means.

3,568,020

SOLID STATE SWITCH PROTECTED THREE PHASE MOTOR REVERSING STARTER

Edward L. Lisi, Freeport, N.Y., assignor to Forney Engineering Company, Dallax, Tex.

Filed Nov. 14, 1968, Ser. No. 775,782
Int. Cl. H02p *1/40*
U.S. Cl. 318—207 4 Claims



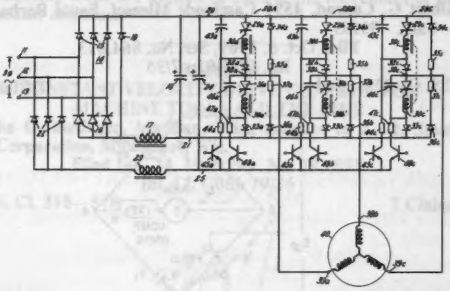
A reversing starter for an AC motor energized by a three phase current supply system in which two phases are reversed to reverse rotation of the motor by a solid state circuit responsive to forward and reverse commands. The starter is controlled by a novel protective solid state logic circuit which assures safe operation by preventing the passage of a selected command signal when the other command signal is present; as well as when such other command signal has been present within a fixed time period prior to the application of the selected command signal.

3,568,021

LOW COST VARIABLE INPUT VOLTAGE INVERTER WITH RELIABLE COMMUTATION

Fred G. Turnbull, Scotia, N.Y., assignor to General Electric Company

Filed May 15, 1969, Ser. No. 824,757
Int. Cl. H02m *5/44, 7/52*
U.S. Cl. 318—227 11 Claims



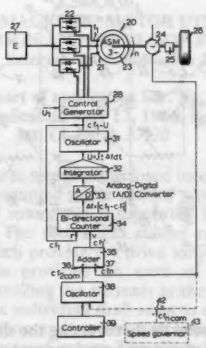
A low cost, solid-state variable input voltage inverter recharges each commutating capacitor through an impedance and a controllable semiconductor switch, preferably a resistor and a transistor in series with a commutating capacitor, to the value of a source of fixed or predetermined voltage to assure reliable commutation over the entire range of input voltage control. The inverter is constructed in single and multiphase versions and is especially suited for industrial applications such as a wide range variable speed AC motor drive.

3,568,022

CONTROL SYSTEM TO CONTROL THE SLIP FREQUENCY OF AN ASYNCHRONOUS DYNAMO ELECTRIC MACHINE

Helmut Domann, Stuttgart; Gerold Ritz; Erika Ritz, Successor, Tiengen/Hochrhein; Gerold Ritz, Successor, Tiengen, and Anna Ritz, Successor, Tiengen, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

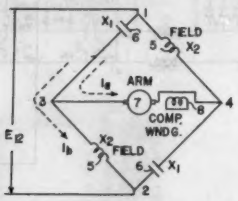
Filed Dec. 6, 1968, Ser. No. 782,008
Claims priority, application Switzerland, Dec. 20, 1967, 18011/67
Int. Cl. H02p *7/42*
U.S. Cl. 318—231 34 Claims



A bidirectional counter 34; 46, 47, 49, has input pulses, which have a pulse repetition rate (PRR) proportional to

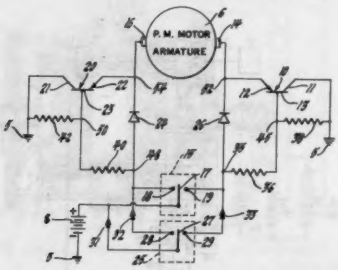
shaft speed connected to a forward count input and pulses from a pulse source having a PRR proportional to the frequency of a power bus of controllable frequency which supplies power to, or absorbs power from the asynchronous dyanmo electric machine connected to a reverse count input. One of the pulse repetition rates, applied to the bidirectional counter, is additionally a function of a desired slip frequency. The output of the counter then, over analogue-digital converter and integrating networks 33, 32 controls the frequency of operation of the power bus in accordance with its count state, thereby holding slip frequency and therewith torque at the desired value.

3,568,023
TUNED CIRCUIT MOTOR SYSTEM
Albert G. Conrad, 4591 Caminode Mieasol, Santa Barbara, Calif. 93105
Filed Oct. 6, 1969, Ser. No. 864,013
Int. Cl. H02p *7/36*
U.S. Cl. 318—244 **7 Claims**



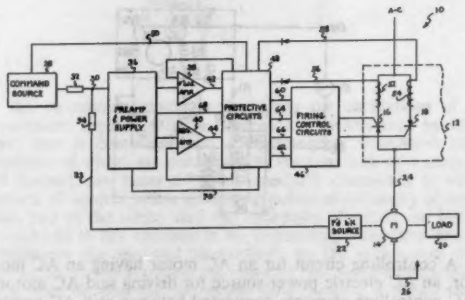
A single-phase alternating-current motor system is provided wherein the motor components form part of a control system that provides for predetermined standstill torque and for running torques of slightly less but of the same order of magnitude as the starting torque. The standstill torque is adjustable. No starting devices are necessary. The efficiency and the power factor are high. This is accomplished by use of a monocyclic network that supplies the armature circuit. The field windings are used in dual function, (a) they provide the field flux that results in torque production, (b) they serve as reactor components of the tuned, monocyclic network that controls the current in the armature circuit.

3,568,024
REVERSING CONTROL FOR PERMANENT MAGNET TYPE DIRECT CURRENT ELECTRIC MOTORS
Samuel B. Robbins, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed July 15, 1968, Ser. No. 744,810
Int. Cl. H02p *1/22*
U.S. Cl. 318—257 **3 Claims**



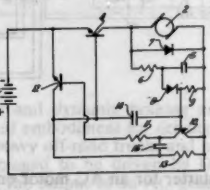
A control for selectively reversing the direction of rotation of the armature of a permanent magnet type direct current electric motors. The movable contact of a single pole, double throw switch is connected to one terminal of a direct current supply potential source and each stationary contact thereof is connected to a respective opposite side of the motor armature. The current carrying electrodes of respective transistors are connected across opposite sides of the motor armature and the other polarity terminal of the direct current supply potential source. With the movable contact of the switch closed to either stationary contact, the transistor connecting the opposite side of the armature with the other terminal of the direct-current supply potential source is biased conductive to complete an energizing circuit for the motor through the current carrying electrodes thereof.

3,568,025
PROTECTIVE CIRCUIT FOR CONTROLLED RECTIFIERS OF A MOTOR CONTROL SYSTEM
Henry J. Havlicek, Erie, Pa., assignor to General Electric Company
Filed Aug. 7, 1969, Ser. No. 848,193
Int. Cl. H02p *5/00*
U.S. Cl. 318—258 **6 Claims**



A motor control system which normally, repeatedly operates in the regenerative mode includes a protective circuit which reduces the failure of controlled rectifiers in a power amplifier of this system as the system enters into a coasting mode of operation. The protective circuit retards the occurrence of firing signals for these controlled rectifiers, rather than eliminate the firing signals, when the current flow through these controlled rectifiers must be rapidly terminated. The firing signals are positively prevented from being eliminated until the current flow is below a preselected low level. After the retarded occurrence of firing signals causes the current flow to be reduced to below this level, the protective circuit automatically eliminates the firing signals and prevents the further conduction through the controlled rectifiers until the drive system is intentionally restarted.

3,568,026
DC MOTOR SPEED CONTROL FOR OPERATION OVER A WIDE RANGE OF SUPPLY VOLTAGES
Otto Anna, Niederhoechstadt, Germany, assignor to Braun Aktiengesellschaft, Frankfurt(Main), Germany
Filed Apr. 29, 1968, Ser. No. 724,888
Claims priority, application Germany, Apr. 29, 1967, B92318
Int. Cl. H02p *5/08, 5/16*
U.S. Cl. 318—330 **8 Claims**



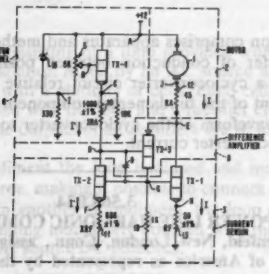
A control arrangement for adapting the operation of a DC motor, of the instrument type, to a voltage source which may

have different supply levels over a substantially broad range. When control and adaptation circuitry is in electronic form, a switching transistor is connected in series with the motor and the power supply for operating the same. An RC network is connected across the motor terminals. A Zener diode is connected in series with a resistor, and the series circuit is, in turn, connected in parallel with the capacitor of the RC network. The base of a transistor amplifier is connected to the junction between the Zener diode and the resistor connected thereto, and the amplified voltage from the transistor amplifier is applied to the switching transistor. As a result, the switching transistor is turned on or off as a function of the voltage applied to the motor. In a mechanical design embodiment, a mechanical switching arrangement is connected in series and between the motor and the voltage supply. A speed governor is mechanically coupled to the motor and actuates the switch so that the motor will be intermittently connected to the voltage supply depending upon the speed of the motor. The arrangement is such that the power supplied to the motor is maintained at the rated design value of the motor.

3,568,027
MOTOR CONTROL CIRCUIT WITH SYMMETRICAL TOPOLOGY

James L. Bacon, and George W. Cleave, Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 18, 1969, Ser. No. 877,723
Int. Cl. H02p *5/16*
U.S. Cl. 318—331 **16 Claims**



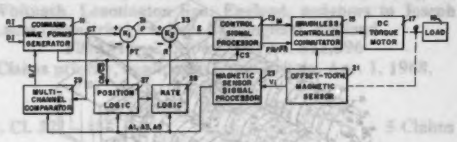
The invention concerns a motor control circuit especially useful with small direct-current-type motors and featuring a symmetrical circuit topology that achieves motor regulation and temperature compensation in a simplified manner. The circuit includes an upper portion comprising a motor model section for establishing a reference voltage to determine the speed of the motor, a parallel circuit section including the motor itself, a lower section intended for detection of current changes in the motor section, and a difference amplifier interconnected with the motor model and motor sections for maintaining an essentially zero potential difference between these sections. The symmetrical layout achieves a highly accurate measure of control over motor speed once a nominal speed has been established. Due to the symmetrical configuration of the circuit, effects of temperature and humidity are essentially eliminated. Some provision is made for alternative ways of controlling the desired motor speed including a variable control for changing motor speed in a regular fashion throughout a desired range of speeds.

3,568,028
SYNCHRONOUS/DC DIRECT-DRIVE SYSTEM

Leo J. Veillette, Lanham, Md.

Filed Mar. 19, 1969, Ser. No. 808,462
Int. Cl. G05b *19/24*
U.S. Cl. 318—571 **14 Claims**

A multiple-loop hybrid control system for controlling a load, which is directly connected to an actuator includes an offset-tooth magnetic sensor which senses output shaft movement and generates position and rate information needed for system control. A command waveforms generator provides command and comparison signals that are compared with the

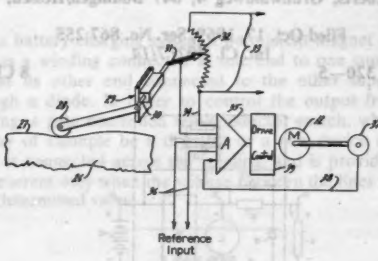


processed magnetic sensor information in suitable electronic comparing loops. The output signals from the electronic comparing loops are utilized to control the movement of the actuator and load.

3,568,029
CONSTANT VELOCITY DRIVE CONTROL FOR MACHINE TOOLS AND THE LIKE

John G. Bollinger, Madison, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed Jan. 24, 1969, Ser. No. 793,859
Int. Cl. G05b *19/36*
U.S. Cl. 318—578 **7 Claims**



This disclosure includes a pair of drive motors energized to move a weld head along two related perpendicular axes in a horizontal plane. The one motor is a variable speed motor. A closed servoloop includes a reference input to establish a constant velocity drive along the related axis for the variable speed motor. A separate cam and follower positions a potentiometer to generate a signal proportional to the velocity correction at each point on the path for lateral movement with respect to the one axis. The signal is combined with the reference input in the servo to establish a modified drive signal. This maintains the resultant horizontal velocity vector constant.

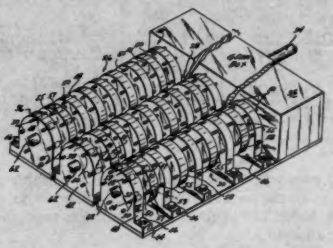
3,568,030
ELECTROMAGNETIC MOTOR UTILIZING ATTRACTION AND REPULSION FORCES

Charles E. Faxon, Veterans Administration Branch, Los Angeles, Calif.

Continuation-in-part of application Ser. No. 661,449, Aug. 17, 1967. This application May 17, 1968, Ser. No. 730,001
Int. Cl. H02k *37/00*
U.S. Cl. 318—696 **4 Claims**

An electromagnetic motor is disclosed incorporating a plurality of rotatably mounted shafts each of which carries a plurality of individual rotors and is supported by a plurality of individual stators. The rotors and stators each incorporate electromagnets which provide the drive torque. At least one switch structure is provided on each of the shafts for synchronously controlling the currents in the electromagnets of the stators on the individual shaft so as to establish repeating cycles of attraction and repulsion in association with the magnets of the associated rotors. The aligned rotor elements on each shaft are offset from those on the other shafts so as to establish a continuity of drive torque, the shafts being mechanically coupled together through a gearbox which is in

turn coupled to a drive shaft. By providing an offset relationship between the magnetic elements of the different shafts, a continuity of drive torque is established; however, the aligned



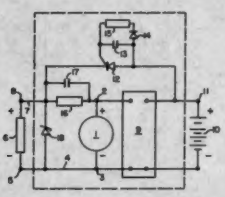
electromagnets on each shaft enable double-ended operation for each internal electromagnet (excepting those of the ends).

3,568,031

VEHICLE POWER SUPPLY FOR BATTERY CHARGING AND LOAD SUPPLY

Klaus Eberts, Grunwaldweg 4, 647 Budingen/Hessen, Germany

Filed Oct. 17, 1969, Ser. No. 867,255
Int. Cl. H02j *7/14*
U.S. Cl. 320—5 **8 Claims**



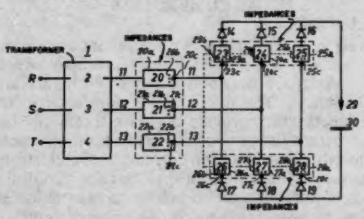
A circuit is disclosed in which a current responsive bistable regulator automatically interrupts the charging of a battery when the latter reaches a predetermined voltage. The dynamo source, however, continues to supply the miscellaneous loads of the vehicle. When the dynamo is cut off the loads are fed by the battery through a thyristor which is shut off when the dynamo is reenergized.

3,568,032

METHOD AND APPARATUS FOR ARC-WELDING

Karl Mages, and Hans Ulli, Kloten, Switzerland, assignors to Elektrodenfabrik Oerlikon Buehrle AG., Zurich, Switzerland

Continuation-in-part of application Ser. No. 580,737, Sept. 20, 1966, now abandoned. This application Mar. 27, 1968, Ser. No. 716,444
Int. Cl. H02m *7/06*
U.S. Cl. 321—5 **30 Claims**



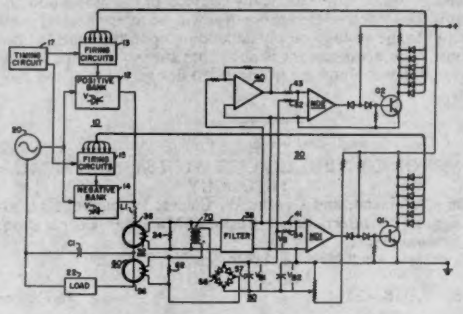
A method and apparatus for arc-welding wherein the welding current delivered to the welding electrode is periodically caused to assume a plurality of essentially different amplitude values, the different amplitude values ensuring control of the formation, release and transport of drops of welding material.

3,568,033

APPARATUS AND METHOD FOR CYCLOCONVERTER BANK SELECTION

Laszlo Gyugyi, Penn Hills, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 6, 1969, Ser. No. 863,828
Int. Cl. H02m *1/08, 5/14*
U.S. Cl. 321—7 **9 Claims**



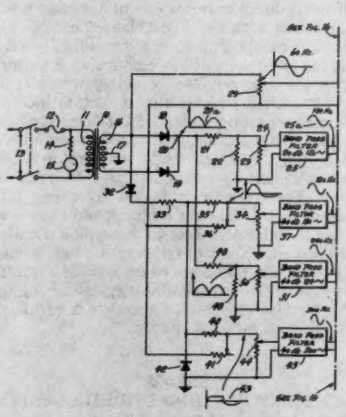
Invention comprises apparatus and method for controlling the transfer of conduction between positive and negative banks of a cycloconverter circuit relative to the zero crossover point of the fundamental component of the AC output current waveform of the cycloconverter to insure a continuous cycloconverter current.

3,568,034

POWER LINE HARMONIC COMB FILTER

Saul Shenfeld, New London, Conn., assignor to the United States of America as represented by the Secretary of the Navy

Filed Oct. 22, 1969, Ser. No. 868,475
Int. Cl. H02m *1/12, 5/00*
U.S. Cl. 321—9 **6 Claims**



A low frequency comb filter having a 60 cycle stepdown transformer source input which is applied across a full-wave and a half-wave rectifier employing limiting diodes. The rectified outputs are then applied to a plurality of channels each having therein a constant impedance level control cir-

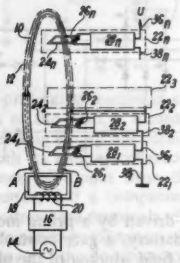
cuit, a band-pass filter, and a variable phase generator. The resultant channel outputs thereof are connected to a common line to provide an input for a component in which the interference is to be canceled via a decoupling element. Amplitude and phase are adjusted to provide positive cancellation.

3,568,035

DEVICE FOR THE PRODUCTION OF A HIGH DIRECT VOLTAGE DIFFERENCE

Alexandre Pierson, Biviers, France, assignor to Commissariat A L'Energie Atomique, Paris, France

Filed Mar. 18, 1969, Ser. No. 808,222
Claims priority, application France, Mar. 20, 1968, 144,633
Int. Cl. H02m 7/00
U.S. Cl. 321—15 **12 Claims**



A transfer coil consisting of a loop provided with a sufficient electrical insulation is fed by an AC source and is inductively coupled with a plurality of cells. Each cell consists of a winding coupled with the loop and a rectifier circuit fed by the winding. The outputs of all rectifiers are in series aiding relation.

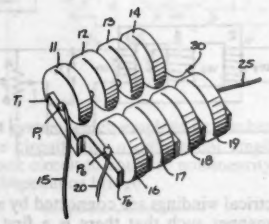
In a first embodiment the loop is closed and inductively coupled to the source, making it possible to connect it to half the high voltage. In another embodiment, the loop ends are connected to a winding inductively coupled with the source and the loop is at the source DC potential.

3,568,036

VOLTAGE-MULTIPLIER ASSEMBLY

Harold B. Rosenberg, New City, N.Y., assignor to Electronic Devices, Inc., Yonkers, N.Y.

Filed Dec. 15, 1969, Ser. No. 885,178
Int. Cl. H02m 7/10; H02b 1/04
U.S. Cl. 321—15 **7 Claims**



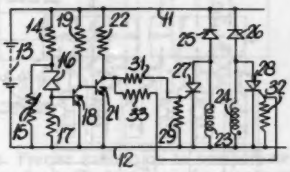
A voltage-multiplier assembly in which a network of solid-state diodes and capacitors are wired together and held securely at separated positions by an insulating matrix having upper and lower rows of spaced tines which define bays for accommodating the capacitors, the tines in the upper row being displaced with respect to the tines in the lower row whereby the capacitors in the bays are in staggered relation. The diodes connected to the capacitors in the bays are protectively embedded in the tines.

3,568,037

ELECTRICAL SUPPLY SYSTEMS INCORPORATING A PERMANENT MAGNET ALTERNATOR WITH VOLTAGE REGULATION

Malcolm Williams, Solihull, and Duncan Barry Hodgson, Whitnash, Leamington Spa, England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Mar. 27, 1969, Ser. No. 811,096
Claims priority, application Great Britain, Apr. 1, 1968, 15,506/68
Int. Cl. H02m 1/08
U.S. Cl. 321—18 **5 Claims**



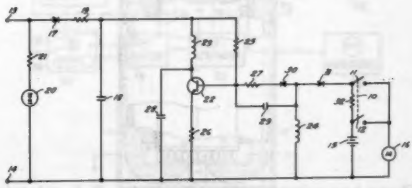
In a battery-charging system a permanent magnet alternator has a winding connected at one end to one supply line and at its other end connected to the other supply line through a diode. In order to control the output from this winding, a gate controlled semiconductor switch, which can by way of example be a thyristor or a new device called a triac, is connected across the winding, and is provided with base current only when the voltage between the lines reaches a predetermined value.

3,568,038

TRANSISTOR INVERTER CIRCUIT

Ray H. Enders, Columbia, Pa.; Henri H. Hoge, Baltimore, Md., and Robert E. Lewis, Peach Bottom, Pa., assignors to Schick Electric Inc., Lancaster, Pa.

Filed Mar. 28, 1969, Ser. No. 811,520
Int. Cl. H02m 7/12
U.S. Cl. 321—47 **9 Claims**



A transistor circuit capable of receiving a high voltage, low frequency supply and changing it to a low voltage high frequency supply.

3,568,039

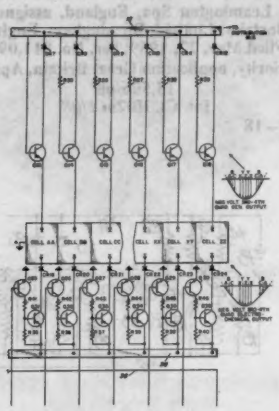
ELECTROCHEMICAL-VARIABLE SPEED CONSTANT FREQUENCY POWER SYSTEM

Milton A. Knight, Box 113, RR 1, Centreville, Va.

Filed July 16, 1969, Ser. No. 842,317
Int. Cl. H02m 5/00
U.S. Cl. 321—61 **6 Claims**

A power system which will produce an alternating current output at controlled frequency from a variable frequency

power input source. Multiple solid state control devices divide the variable input into incremental voltage controlled pulses which are connected to bipolar electrochemical cells.



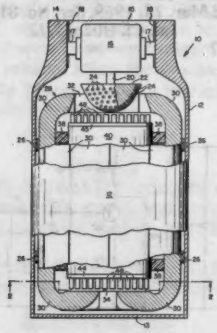
Then a reference voltage and frequency circuit discharges the electrochemical cells in an order of voltage synchronized with the reference wave form to produce an accurately controlled frequency output.

3,568,040

MAGNETOMOTIVE ELECTRIC CURRENT GENERATOR UTILIZING VIBRATING MAGNETIZABLE METAL STRIPS

Van P. Combs, Penfield, N.Y., assignor to Mega Power Corporation, Rochester, N.Y.

Filed Feb. 19, 1969, Ser. No. 800,383
Int. Cl. H02k *35/00*
U.S. Cl. 322—3 **9 Claims**



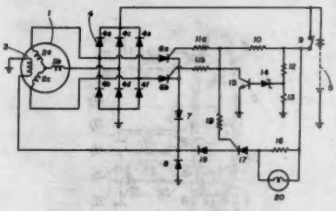
The generator comprises a stationary core housed in a hollow, generally cylindrical, permanent magnet. A plurality of elongate, axially extending, angularly spaced, magnetizable metal shims are secured in radially spaced, concentric circular rows in the core, and project slightly axially beyond opposite ends, respectively, of the core to confront opposite poles, respectively, of the permanent magnet. A helical wire coil of conductive material is wound around each row of shims; and successive windings of the coil are separated from one another by thin sheets of conductive foil and dielectric material. A direct current motor is mounted at one end of the core. Its armature carries a head containing a plurality of like-oriented permanent magnets. When the head rotates, its magnets distort the lines of flux extending between the adjacent ends of the shims and the surrounding magnet, causing the shims to vibrate and induce a voltage in the coil. The coil and alternating layers of metal foil and dielectric material define condensers that are charged by the voltage induced in the coil. This charge, and the induced voltages, produce the power output of the generator.

3,568,041

ALTERNATOR CONTROL DEVICE HAVING SIMPLIFIED CHARGE-DISCHARGE INDICATOR

Kenjiro Arakane, Himeji-shi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha

Filed Oct. 29, 1968, Ser. No. 771,489
Claims priority, application Japan, Nov. 2, 1967, 42/70,587
Int. Cl. H02p *9/30*
U.S. Cl. 322—28 **9 Claims**



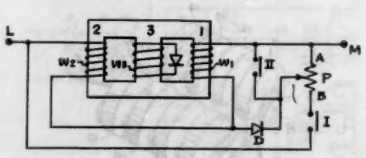
In an alternator driven by a prime mover of a vehicle to charge a storage battery, a gate controlled rectifier is provided to excite the field winding of the alternator and means responsive to the output voltage of the alternator is provide to effect ON-OFF control of the gate controlled rectifier. To provide initial separate excitation current from the battery, a second excitation circuit including a second gate controlled rectifier is provided which is rendered inoperative as the output voltage of the alternator builds up. A lamp is directly coupled to the second excitation circuit to indicate when separate excitation current is being supplied and that the battery is not being charged.

3,568,042

VOLTAGE REGULATOR FOR APPARATUS OPERATED BY ALTERNATING CURRENT, PARTICULARLY A STEPLESS SPEED CONTROLLER FOR ELECTRIC MOTORS

Alberto Della Casa, Salita Quarcino, 10, Como, Italy

Filed June 3, 1969, Ser. No. 829,893
Claims priority, application Italy, June 7, 1968, Nov. 16, 1968, 17499A/68;23827A/68
Int. Cl. G05f *1/20*
U.S. Cl. 323—7 **8 Claims**

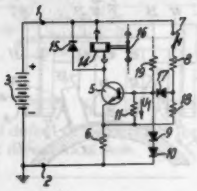


Three electrical windings are connected by a paramagnetic frame in a manner such that there is a first magnetic flux path interconnecting the intermediate winding and one end winding, and a second magnetic flux path interconnecting the intermediate winding and the other end winding. The intermediate winding has a diode in series therewith so that current will only flow in one direction through the intermediate winding. The two end windings are connected in series between the power supply connection and the motor connection with the arrangement being such that the magnetic flux in the two paths balances out where the paths pass through the intermediate winding. One end winding is shunted by a diode connected in series with variable resistance means.

3,568,043
DIODE CONSTANT VOLTAGE SOURCE LIMITS CURRENT THROUGH A SERIES TRANSISTOR CIRCUIT

Friedrich Rabus, Stuttgart-Bad, Cannstatt, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Apr. 10, 1969, Ser. No. 814,907
Claims priority, application Germany, Apr. 19, 1968, P 17 63 195.7
Int. Cl. G05f *1/58*
U.S. Cl. 323—9 9 Claims



To provide a self-protecting feature in case of malconnection or malfunction of the load, a transistor controlling an electromagnetic operating circuit has connected a sensing resistance in series with its emitter-collector path, a constant voltage source formed of diodes from the current source (battery) to the emitter, and a comparison resistance connected across the emitter-base terminals of the transistor, the relative values of the sensing resistance, the comparison resistance and the voltage of the constant voltage source being so selected relative to each other that under ordinary operating conditions the emitter-base potential is sufficient to provide full conduction of the transistor, whereas, upon decrease of total resistance of the emitter-collector circuit, the transistor is controlled to assume a high resistance value and limit the flow of current therethrough to a safe value.

3,568,044
LINEARIZING CIRCUIT FOR HIGH OUTPUT TRANSDUCERS

Shmuel Elazar, Camarillo, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Sept. 12, 1968, Ser. No. 759,376
Int. Cl. G01r *17/10*
U.S. Cl. 323—75 6 Claims

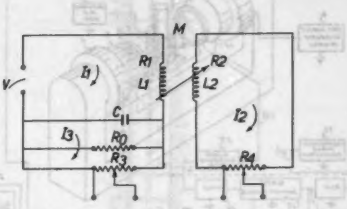
A transducer system which employs in combination an impedance bridge circuit with a differential amplifier and includes a feedback circuit to equalize nonlinearity in the components of the impedance bridge.

3,568,045
ALTERNATING CURRENT DEVICES FOR OBTAINING A 90° PHASE SHIFT

Robert Yorke, Southampton, England, assignor to J. J. Lloyd Instruments Ltd., Southampton, England

Filed Jan. 17, 1969, Ser. No. 792,016
Claims priority, application Great Britain, Jan. 22, 1968, 3,255
Int. Cl. G05f *3/00*
U.S. Cl. 323—108 5 Claims

An alternating current device for establishing adjustable currents having a 90° phase shift by which the in phase and quadrature components of an applied AC voltage may be measured. The device includes a variable mutual inductor having an in phase resistor in series with the primary winding of the variable mutual inductor and a quadrature resistor in series with the secondary thereof. The in phase and quadrature components of the applied voltage are measured across

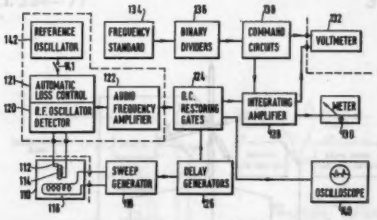


these resistors. Precise calibration to compensate for phase error and errors due to fluctuations in frequency are obviated by providing a capacitor in parallel with the in phase resistor. In addition, a shunt resistor may be connected across the in phase resistor to reduce the value of mutual inductance required to induce a given current in the quadrature resistor.

3,568,046
APPARATUS FOR EXAMINATION AND MEASUREMENT BY MEANS OF NUCLEAR MAGNETIC RESONANCE PHENOMENA

Edward Watson, Hayling Island, England, assignor to Newport Instruments Limited, Newport Pagnell, Buckinghamshire, England

Continuation-in-part of application Ser. No. 485,034, Sept. 3, 1965. This application Mar. 10, 1969, Ser. No. 805,492
Int. Cl. G01n *27/78*
U.S. Cl. 324—0.5 1 Claim



A signal including a plurality of successive and amplified nuclear magnetic resonance pulses obtained from a sample is gated to a display instrument only during separated short intervals of time which each embrace the period of occurrence of one of said pulses. Integration of a succession of detected pulses is effected under the control of a timing circuit.

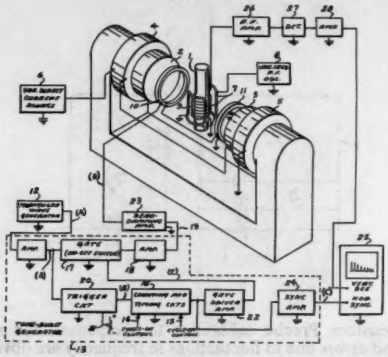
3,568,047
APPARATUS AND METHOD FOR MEASURING NUCLEAR SPIN-LATTICE RELAXATION TIME (T_1) BY TONE-BURST MODULATION

David C. Look, and Donald R. Locker, Dayton, Ohio

Filed Mar. 17, 1969, Ser. No. 807,836
Int. Cl. G01n *27/78*
U.S. Cl. 324—0.5 5 Claims

The static field of an NMR spectrometer is modulated by a series of repeated tone bursts of an audio wave of triangular or sinusoidal form with the bursts separated by periods of at

least four times the spin-lattice relaxation time T_1. The static field has a value such that the superimposed modulation causes field strength excursions equal distances above and below the magnetic resonance value. The spectrometer output signals produced by the passages through the resonance value are displayed by an oscilloscope having its horizontal sweep synchronized with the start of each tone burst. The value of T_1 is calculated from measurements made on the recorded oscilloscope display.

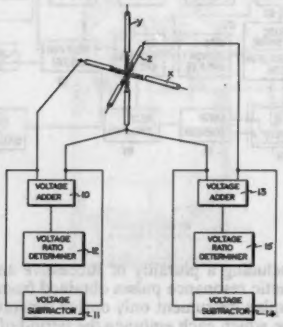


3,568,048

THREE COIL SYSTEM FOR GEOPHYSICAL PROSPECTING UTILIZING MAGNETIC TIME TRANSIENTS

William A. Robinson, Don Mills, Ontario, Canada, assignor to McPhar Geophysics Limited, Don Mills, Ontario, Canada

Filed Dec. 9, 1968, Ser. No. 782,262
Int. Cl. G01v *3/00*
U.S. Cl. 324—8 **8 Claims**



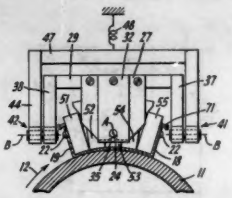
A method and apparatus for detecting geophysical anomalies by measuring the naturally occurring audio frequency transient magnetic fields (AFMAG fields) in two planes comprising utilizing three orthogonal coils and processing their output voltages in appropriate proportions to give the effect of an equivalent coil system comprising two pairs of coils with each coil of each pair having its axis inclined at 45° to the horizontal and at 90° to the axis of the other coil of such pair, one pair of such equivalent coils lying in one vertical plane and the other pair of such equivalent coils lying in another vertical plane.

3,568,049

ADJUSTABLE SEARCH SHOE FOR USE IN NONDESTRUCTIVE TESTING OF TUBULAR MEMBERS

Robert D. Barton, Houston, Tex., assignor to AMF Incorporated, New York, N.Y.

Filed Dec. 30, 1968, Ser. No. 787,804
Int. Cl. G01r *33/00*
U.S. Cl. 324—34 **12 Claims**



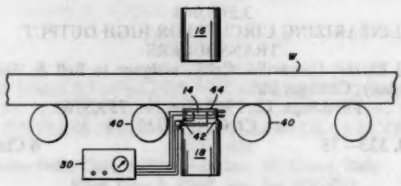
A search shoe for use in nondestructive testing of metallic tubular objects. The curvature of the objecting engaging surface of the shoe may be adjusted to closely conform to the wall of any tubular object whose diameter is within a given range.

3,568,050

METHOD FOR MONITORING FERROMAGNETIC MATERIAL TEMPERATURE ABOVE THE CURIE POINT

Douglas L. Dill, Parks Township, Armstrong County, Pa., assignor to United States Steel Corporation

Filed May 29, 1969, Ser. No. 829,040
Int. Cl. G01r *33/00*
U.S. Cl. 324—34 **2 Claims**



A method and apparatus for automatically measuring and/or recording the temperature of a paramagnetically susceptible material, such as steel during hot rolling, whereby the material is passed through a magnetic field and the magnetic field strength is changed in proportion to the material's paramagnetic susceptibility. A semiconducting probe measures the change in field strength, and through proper instrumentation the change in field strength is recorded as degrees of temperature.

3,568,051

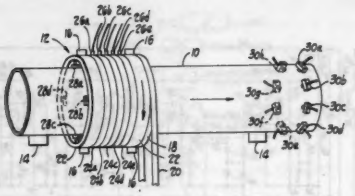
AN EDDY CURRENT DEFECT DETECTOR UTILIZING PLURAL ROTATING SEARCH COILS IN COMBINATION WITH LOGIC CIRCUITRY AND MARKERS

Joseph Vild, Lyndhurst, Ohio, assignor to Republic Steel Corporation, Cleveland, Ohio

Filed Jan. 6, 1969, Ser. No. 789,159
Int. Cl. G01r *33/12*
U.S. Cl. 324—37 **43 Claims**

In eddy current defect detecting and marking apparatus, a plurality of search coils are mounted for rotation about an axis coincident with the axis of an elongated article being inspected. A plurality of magnets are mounted for rotation with the search coils and positioned to actuate fixed-position switches. Signals from the search coils and from the switches are utilized in logic circuitry to cause actuation of ap-

propriate ones of a plurality of marking devices depending on where circumferentially and longitudinally of the cylindrical



article a detected defect or defects lies for physically marking on the article the defect location.

3,568,052

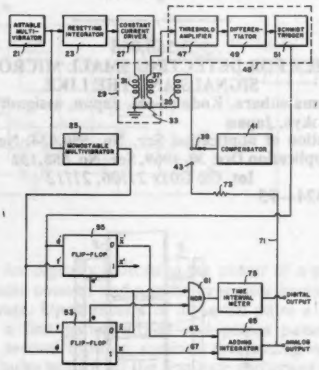
TIME INTERVAL MAGNETOMETER

William W. Anderson, 205B Boxwood Road, Annapolis, Md.

Continuation of application Ser. No. 414,926, Nov. 30, 1964, now abandoned. This application June 6, 1969, Ser. No. 830,971

Int. Cl. G01r *33/02*

U.S. Cl. 324—43 **9 Claims**



A magnetometer system having a probe core of ferromagnetic material with a primary and secondary winding, the primary winding being driven by a linear ramp current from a constant current driver which current rises during one-half cycle of the cycle of an astable multivibrator to drive the core through its minimum flux density to saturation. The output pulse appearing in the secondary winding of the probe as the saturation of the probe passes through 180° is shifted in time by the presence of an external magnetic field as the driver current rises with time. This time interval shift is measured and corresponds directly to the magnitude of the external magnetic field.

3,568,053

APPARATUS FOR ESTABLISHING ELECTRICAL CONTACT WITH THE CASING IN A WELLBORE

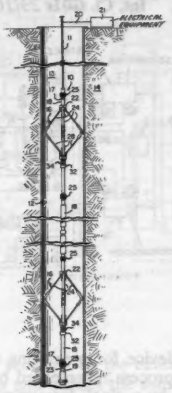
James M. Kilpatrick, Claremore, and Robert E. Walker, Tulsa, Okla., assignors to Sinclair Oil Corporation, New York, N.Y.

Filed Oct. 15, 1968, Ser. No. 767,663

Int. Cl. G01n *27/02*

U.S. Cl. 324—62 **5 Claims**

An apparatus for establishing electrical contact with the casing within a well bore. A plurality of flexible support members each have their first end attached to a central shaft and their second end attached to a collar slidably engaging the shaft. An electrical contact wheel is mounted on each



support member. A fixed shaft collar restrains a spring which biases the slidable collar, causing the support members to flex, thereby urging the contact wheels outwardly to contact the well casing.

3,568,054

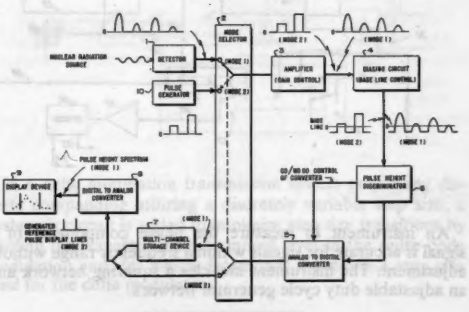
PULSE HEIGHT SPECTRUM ANALYSIS METHOD AND MEANS

Wallace A. Ross, Los Altos, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 9, 1968, Ser. No. 704,453

Int. Cl. G01j *39/18;* **G01t** *1/20;* **G01n** *23/10*

U.S. Cl. 324—77 **3 Claims**



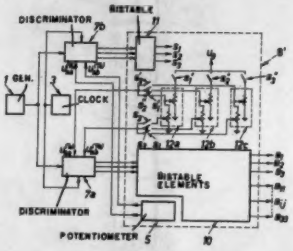
The total number of occurrences of pulse heights are stored in a multichannel storage device and are displayed in the form of a spectrum. At least one generated reference pulse is provided for identifying a portion of the spectrum to be analyzed. The pulse heights and the generated reference pulse are processed by the same equipment so that to analyze a selected portion of the spectrum the required settings of the base line or gain control or any other parameters which are sensitive to pulse height are found by using the generated reference pulse display lines as a guide.

3,568,055

ELECTRONIC DEVICE FOR MEASURING STATISTICAL PARAMETERS OF STOCHASTICAL PROCESSES

Wolfgang Wehrmann, Vienna, Austria, assignor to Norma Fabrik elektrischer Messgerate Gesellschaft m.b.H., Vienna, Austria

Filed Oct. 2, 1967, Ser. No. 672,093
Claims priority, application Austria, Oct. 6, 1966, 9356/66
Int. Cl. G01r *23/16*
U.S. Cl. 324—77 14 Claims



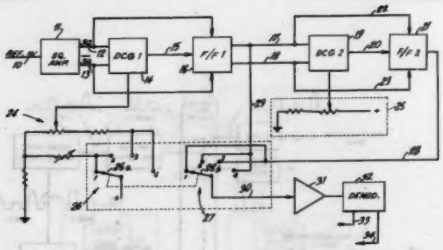
An electronic device for measuring statistical parameters of a stochastical process represented by an electrical signal which is sampled by a clock frequency, the sampled values being divided into at least two classes of sizes by comparison with at least one controllable threshold voltage, and statistical parameters of the stochastical process measured, comprising at least one controllable sampled amplitude discriminator the input of which is connected to the electronic source of said signal and an automatic device having at least one set of bistable elements and at least one set of electronic means for controlling the sampled amplitude discriminator.

3,568,056

PHASE MEASUREMENT INSTRUMENT

Eugene R. Keeler, Suffern, N.Y., assignor to Timex Corporation, Waterbury, Conn.

Filed Oct. 15, 1968, Ser. No. 767,654
Int. Cl. G01r *25/00*
U.S. Cl. 324—83 4 Claims



An instrument to measure the phase components of a signal is accurate for signals within a frequency range without adjustment. The instrument includes a squaring network and an adjustable duty cycle generator network.

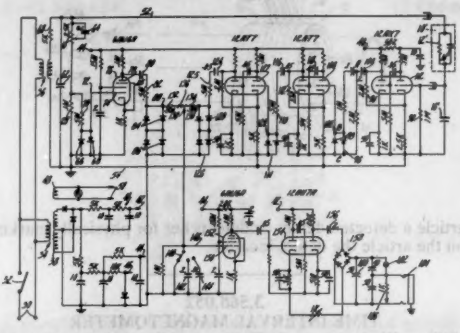
3,568,057

PHASE MEASUREMENT APPARATUS INCORPORATING SQUARE WAVE VOLTAGE DIFFERENCE COMPENSATION

Edmund Povey, Medford, Mass., assignor to Doble Engineering Company, Belmont, Mass.

Original application May 4, 1965, Ser. No. 453,145, now Patent No. 3,452,274, dated June 24, 1969. Divided and this application Oct. 24, 1968, Ser. No. 770,321
Int. Cl. G01r *25/00*
U.S. Cl. 324—83 6 Claims

Apparatus for measuring the dielectric quality of electrical insulating oil includes a test cell for receiving the oil. The test cell includes two electrodes of a capacitor and a high value no loss capacitor is connected in series with the test cell, so that a sinusoidal voltage in quadrature with the current through the test cell is produced. A second sinusoidal voltage is provided across a zero phase angle standard resistor. Both



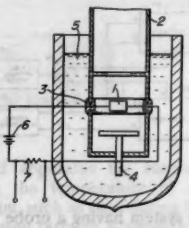
sinusoidal voltages are converted to symmetrical square waves and a difference signal is produced by comparing the two square waves. The difference signal is integrated and applied to a meter to provide a direct indication of the loss characteristics of the oil being tested.

3,568,058

DEVICE FOR DETECTING SMALL MICROWAVE SIGNALS AND THE LIKE

Kiichi Komatsubara, Kodaira-shi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of application Ser. No. 596,634, Nov. 23, 1966. This application Dec. 30, 1969, Ser. No. 888,132
Int. Cl. G01r *21/06, 21/12*
U.S. Cl. 324—95 2 Claims



A device for detecting small signals of a microwave, millimeter wave and the like level, wherein a detector element is composed of a III—V group semiconductor compound selected from the group consisting of N-type InSb and InAs, and is conditioned so as to be in the state of the quantum limit. The device is responsive to signals having a high speed and/or a broad range of power.

3,568,059

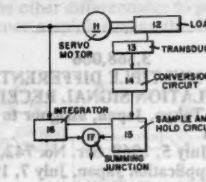
ELECTRONIC TACHOMETER

Frank J. Sordello, San Jose, Calif., assignor to Information Storage Systems, Inc., Cupertino, Calif.

Filed Jan. 21, 1969, Ser. No. 792,386
Int. Cl. G01p *3/46*
U.S. Cl. 324—177 9 Claims

An electronic tachometer for providing a continuous indication of velocity of a motor-driven load including: a sensor

operatively connected to the load for generating a periodic position signal; means for converting the position signal to an accurate indication of load velocity; a sample and hold circuit for periodically sampling the velocity measurement and



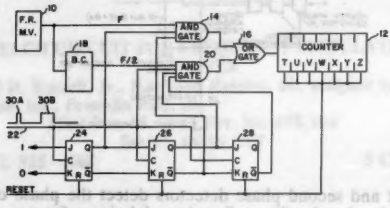
retaining the level of the sample; an integrator for integrating the drive current applied to the motor; and a junction for recalibrating the integrated drive current with each retained sample to form a continuous velocity signal.

3,568,060

PULSE CENTER FINDER EMPLOYING DUAL COUNTER RATE WITH SYNCHRONOUS OPERATION

Joseph A. Howells, Cinnaminson, N.J., assignor to Science Accessories Corporation, Southport, Conn.

Filed Oct. 18, 1967, Ser. No. 676,268
Int. Cl. G04f *9/00*
U.S. Cl. 324—186 **6 Claims**



A device for digitally indicating the center of a pulse employing a pulse counter and a pulse generator having a fixed generating rate. Upon receipt of an initial pulse a first flip-flop opens a first gating circuit and passes pulses to the counter. A second flip-flop receives the leading edge of a subsequent pulse to turn off the first gate and opens a second gate. The second gate in turn allows pulses at one-half the fixed generating rate to accumulate in the counter. The trailing edge of the second pulse changes the state of the second flip-flop and turns off the second gate. The accumulated count is now representative of the measure from the initial timing pulse to the center of the second pulse. A further flip-flop, upon receipt of a further pulse, changes state and insures that the gating circuits do not open to permit further counting. The two level counting is accomplished by a pulse frequency dividing stage connected to the pulse source, or, alternatively, by using the output of the first counter stage.

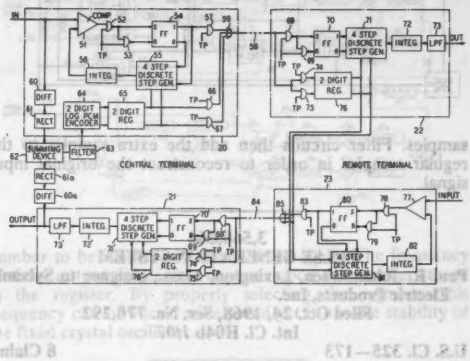
3,568,061

BILATERAL DIGITAL TRANSMISSION SYSTEM WITH COMPANDING HAVING SAME STEP SIZE IN EACH DIRECTION

Stephen J. Brolin, Bronx, N.Y., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill,Berkeley Heights, N.J.

Filed Apr. 29, 1968, Ser. No. 724,859
Int. Cl. H04b *1/00*
U.S. Cl. 325—38 **11 Claims**

A digital transmission system is disclosed utilizing forward and backward acting companding for transmission from and to a central terminal to and from a plurality of remote terminals, respectively. A variable size step pulse source is used at each modulator to effectively achieve compression and another is used at each demodulator to effectively achieve complementary expansion. Apparatus is located at the central terminal which senses parameters of the message signals



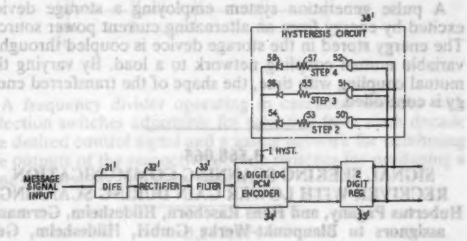
transmitted from and received by the central terminal, sums the sensed parameters and utilizes the sum to determine the amplitudes of the variable size step pulses produced for each modulator and demodulator.

3,568,062

DISCRETE COMPANDOR UTILIZING HYSTERESIS

Stephen J. Brolin, Bronx, N.Y., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Apr. 29, 1968, Ser. No. 724,853
Int. Cl. H04b *1/00*, *7/00*
U.S. Cl. 325—38 **4 Claims**



In a delta modulation transmission system employing discrete companding utilizing a discretely variable step size, a hysteresis circuit is added to minimize step size transitions by altering the traversed predetermined level in the pulse code modulation encoder which determines the discrete step size used for the delta modulator.

3,568,063

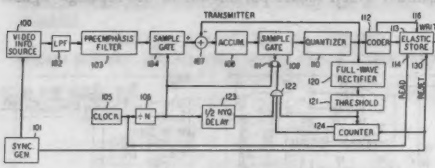
SLIDING SCALE PREDICTIVE CODING SYSTEM

Earl F. Brown, Piscataway, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Apr. 2, 1969, Ser. No. 812,714
Int. Cl. H04b *1/00*, *7/00*
U.S. Cl. 325—38 **10 Claims**

A sliding scale coding system is disclosed which effectively extends the range of the quantizing circuit in a predictive coder by automatically inserting extra samples when changes in the input signal exceed a predetermined level. The extra samples are quantized and transmitted in succession with the

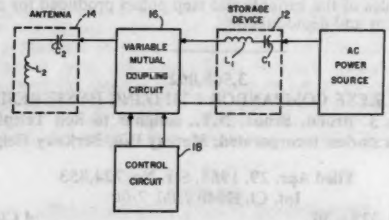
regular samples. At the receiver the extra samples are detected and reconstructed in proper order with the regular samples. Filter circuits then add the extra samples to the regular samples in order to reconstruct the original input signal.



3,568,064
PULSE GENERATION SYSTEM

Paul R. Johannessen, Lexington, Mass., assignor to Sylvania Electric Products, Inc.

Filed Oct. 24, 1968, Ser. No. 770,292
Int. Cl. H04b 1/02
U.S. Cl. 325—173 **8 Claims**

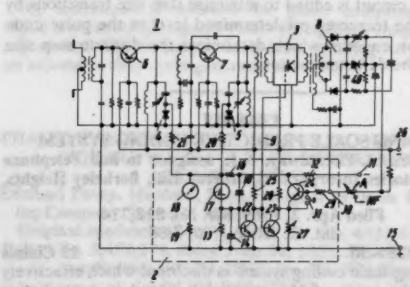


A pulse generation system employing a storage device excited by energy from an alternating current power source. The energy stored in the storage device is coupled through a variable mutual coupling network to a load. By varying the mutual coupling with time, the shape of the transferred energy is controlled.

3,568,065
SIGNAL SEEKING SCANNING COMMUNICATION RECEIVER WITH LOWER GAIN DURING SCANNING

Hubertus Pagany, and Hans Rasehorn, Hildesheim, Germany, assignors to Blaupunkt-Werke GmbH, Hildesheim, Germany

Filed July 15, 1968, Ser. No. 744,839
Claims priority, application Germany, Aug. 31, 1967, B94243
Int. Cl. H04b 1/32
U.S. Cl. 325—422 **6 Claims**

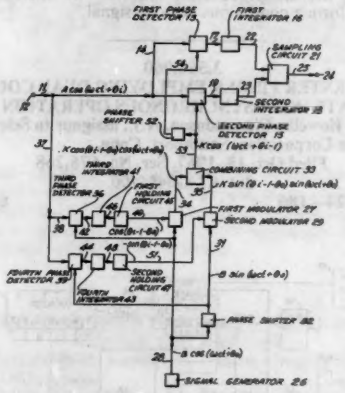


The threshold for signals to be selected during scanning is set such that signals will be selected which are just above the noise level of the receiver; during scanning, a gain control circuit regulates the overall gain of the receiver below its normal sensitivity, so that only stronger signals will be selected which, however, after having been selected will be amplified with a higher gain than during the scanning for selection.

3,568,066
FREQUENCY MULTIPLE DIFFERENTIAL PHASE MODULATION SIGNAL RECEIVER

Noriaki Fujimura, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed July 5, 1968, Ser. No. 742,897
Claims priority, application Japan, July 7, 1967, 42-43 775
Int. Cl. H04l 27/14
U.S. Cl. 325—320 **6 Claims**



First and second phase detectors detect the phase of the input signal and utilize a first demodulating reference signal and a second reference signal having a phase difference of 90° from the first reference signal. A first integrator is connected to the first phase detector and a second integrator is connected to the second phase detector. A sampling circuit connected to the first and second integrators samples the outputs thereof and shapes the waveforms of the output. A signal generator generates a single reference signal. Third and fourth phase detectors detect the phase of the input signal utilizing the single reference signal and a fourth reference signal having a phase difference of 90° from the single reference signal. A third integrator is connected to the third phase detector and a fourth integrator is connected to the fourth phase detector. A first holding circuit is connected to the third integrator and a second holding circuit is connected to the fourth integrator. Each holding circuit holds a signal for a determined period. A first modulator connected to the first holding circuit modulates the output signals thereof with the single reference signal. A second modulation connected to the second holding circuit modulates the output signals thereof with the fourth reference signal. A combining circuit connected between the first and second modulators and each of the first and second phase detectors combines the output signals of the modulators.

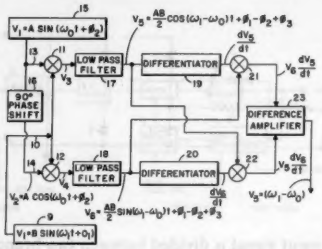
3,568,067
FREQUENCY DISCRIMINATOR WITH OUTPUT INDICATIVE OF DIFFERENCE BETWEEN INPUT AND LOCAL REFERENCE SIGNALS

Jerry G. Williford, Tustin, Calif., assignor to Collins Radio Company, Cedar Rapids, Iowa

Filed June 13, 1969, Ser. No. 833,031
Int. Cl. H04l 27/14; H03d 3/02
U.S. Cl. 325—320 **5 Claims**

A first means extracts the difference frequency components of the input signal (f_{in}) and a first reference signal

(F_r). A second means extracts the difference frequency components of said input signal and a second reference signal in phase quadrature with the first reference signal. The two difference frequency signals are separately differentiated. Then the output from each of the two differentiators is multiplied by the input to the other differentiator to provide two output signals. A difference amplifier takes the difference between

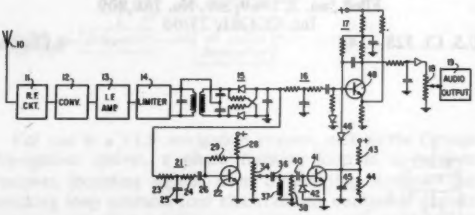


these two output signals to provide a signal in accordance with the expression

$$\frac{d\theta}{dt} = (W_{in} - W_r)$$

where $d\theta/dt$ is the rate of change of phase between the input signal and the reference signal.

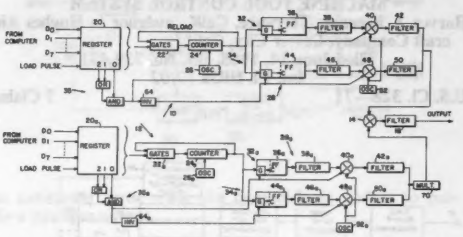
3,568,068
SQUELCH CIRCUIT FOR FREQUENCY MODULATION RECEIVER
Daniel D. Russell, Jr., Harwood Heights, Ill., assignor to Motorola, Inc., Franklin Part, Ill.
Filed Oct. 13, 1967, Ser. No. 675,104
Int. Cl. H04b 1/10
U.S. Cl. 325—348 **5 Claims**



Squelch circuit for frequency modulated receiver having a wide band discriminator which reproduces the modulating signal and noise extending at frequencies substantially higher than the modulating signal, with the noise increasing in amplitude in the absence of the modulating signal. The full frequency range of the discriminator output is applied through a limiter and a level control potentiometer to a frequency selective circuit which selects noise extending above the modulating frequency. The selected noise is detected and amplified in a full wave semiconductor circuit and applied to bias off the first audio stage of the receiver when the noise exceeds a predetermined voltage.

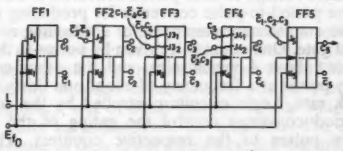
3,568,069
DIGITALLY CONTROLLED FREQUENCY SYNTHESIZER
William D. Gabor, Amherst, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.
Filed Dec. 16, 1968, Ser. No. 784,081
Int. Cl. H03b 1/04; H03k 7/08
U.S. Cl. 328—14 **15 Claims**

A digitally controlled variable frequency synthesizer has a register which stores a number corresponding to the desired output frequency. This number is loaded into a counter which counts pulses from a stable, fixed-frequency oscillator. The counter then counts backward from that number to zero and then emits an output pulse. That causes the stored



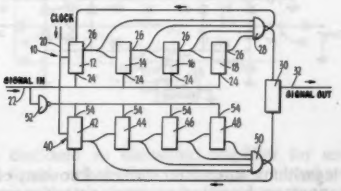
number to be loaded into the counter again. The frequency of these output pulses thus depends upon the number stored in the register. By properly selecting the number, this frequency can be varied widely and yet it has the stability of the fixed crystal oscillator.

3,568,070
DECADE-TYPE FREQUENCY DIVIDER
Gerhard Kaps, and Heinz-Peter Kunert, Hamburg, Germany, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Apr. 5, 1968, Ser. No. 719,035
Claims priority, application Germany, June 23, 1967, P42436
Int. Cl. H03k 21/16
U.S. Cl. 328—42 **3 Claims**



A frequency divider operating in cascaded decades with selection switches adjustable for selecting from each decade the desired control signal and a gating network for combining the outputs of the respective decade switches for producing a time uniform divided pulse sequence.

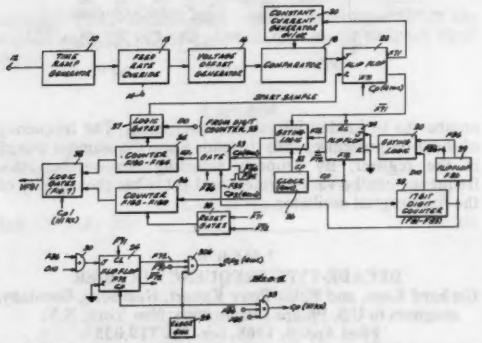
3,568,071
DIGITAL FILTER
Beat A. Kocher, Alameda, Calif., assignor to The Singer Company
Filed Oct. 21, 1968, Ser. No. 769,096
Int. Cl. H03k 21/32
U.S. Cl. 328—48 **1 Claim**



In a system for accepting each change of signal level as part of a message pulse only if it persists for a prescribed time, that time is measured with a high-speed counter to give high precision and to reduce the jitter that is imposed on the recovered message. A separate counter for each input signal

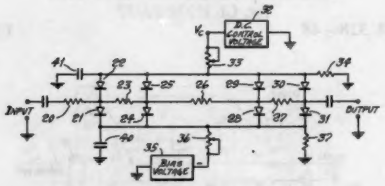
level runs in response to that level and is reset in response to the other level. On reaching a prescribed count it passes a signal to an output flip-flop.

3,568,072
MACHINE TOOL CONTROL SYSTEM
Harvey J. Rosener, Torrance, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Filed June 24, 1968, Ser. No. 739,421
Int. Cl. H03k 17/02
U.S. Cl. 328—71 7 Claims



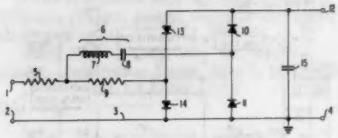
A machine tool control system for producing a pulse train for controlling a servo in an axis of a machine tool, in which an adjustable voltage-to-time period converter is used to control a time period-to-pulse converter for producing the pulse train. Two counters are employed for controlling enabling of an output gate. One counter is driven by pulses at the system clock rate, about 4 megacycles, and the other counter is driven by pulses at a frequency of about one thirty-fourth of the clock rate. Logic circuits controlled by the voltage-to-time period converter control the gating of the different frequency pulses to the respective counters. The lower frequency pulses only are gated by the output gate.

3,568,073
LOGARITHMIC ATTENUATOR
William G. McGuffin, Willingboro, N.J., assignor to the United States of America as represented by the Secretary of the Navy
Filed Sept. 9, 1968, Ser. No. 758,458
Int. Cl. G06g 7/24
U.S. Cl. 328—145 3 Claims



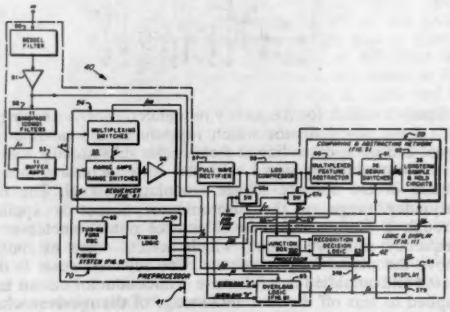
The logarithmic attenuator disclosed consists of a cascade of L-sections, each section comprising a series resistor and a shunt impedance formed by a parallel pair of forwardly biased diodes. These diodes are in series with a control voltage and consequently share a common control current. One of the diodes serves to isolate the input signal form the low impedance control voltage source, thereby allowing this voltage to be applied directly to the diodes so as to preserve their logarithmic characteristic.

3,568,074
FREQUENCY-SENSITIVE CIRCUIT
James W. Carroll, Waynesboro, Va., assignor to General Electric Company
Filed Aug. 1, 1968, Ser. No. 749,511
Int. Cl. H03b 3/04; H03k 5/20
U.S. Cl. 328—140 6 Claims



An AC input signal is divided between two branch circuits, one comprising an LC series resonance circuit in series connection with a first unidirectional current device, and the other comprising a resistor in series connection with a second unidirectional current device poled opposite to the first unidirectional current device. The two branch circuits are connected in parallel to a common output terminal. A nonpolarized capacitor is connected between the output terminal and an electrical reference or ground to bypass to ground the AC voltage component that otherwise would exist at the output terminal, and to provide a smooth DC signal having one polarity when the frequency of the AC input signal is within a predetermined frequency range and an opposite polarity when the frequency is outside the predetermined frequency range.

3,568,075
FEATURE ABSTRACTOR
George J. Dusheck, Jr., Cinnaminson, N.J.; Thomas P. Kelley, Cornwells Heights, Pa., and Phillips B. Scott, Haddonfield, N.J., assignors to the United States of America as represented by the Secretary of the Navy
Filed Jan. 3, 1969, Ser. No. 788,809
Int. Cl. G01r 23/00
U.S. Cl. 328—146 8 Claims



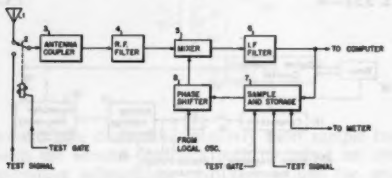
A feature abstractor producing an output signal indicative of the amplitude slope of sequentially sampled amplitude-time-frequency domain signals. This is obtained by taking the differences between successive pulses and applying such differences to the inputs of neuron gates. The neuron gates detect when two successive pulses are of the same polarity and provide an output indicative of the lesser of the two successive pulses.

3,568,076

RECEIVER PHASE SHIFT STABILIZER

Alexander F. Thornhill, Accokeek, Md., assignor to the United States of America as represented by the Secretary of the Navy

Filed Jan. 2, 1969, Ser. No. 789,097
Int. Cl. H03b 3/04
U.S. Cl. 328—155 5 Claims



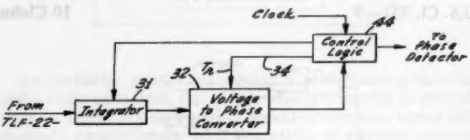
The invention consists of a radio receiver phase shift stabilization system which operates by intermittently directing a test signal through the receiver, measuring the phase shift of the signal, storing this information and thereafter compensating for any subsequent change in phase shift.

3,568,077

PSEUDO VOLTAGE CONTROLLED OSCILLATOR

Yoshiaki Fujimoto, Gardena, Calif., assignor to Northrop Corporation, Beverly Hills, Calif.

Filed Sept. 3, 1968, Ser. No. 756,923
Int. Cl. H03b 3/04
U.S. Cl. 328—155 6 Claims



For use in a VLF navigation system, such as the Omega Navigation system, a phase tracking loop in a receiver receives incoming signals from transmitting stations. The tracking loop contains four electronically controlled pseudo voltage-controlled oscillators, to eliminate the need for all but one master crystal oscillator, whose outputs provide necessary signals within the receiver. The pseudo oscillator comprises an integrator and a voltage-to-phase converter using an external clock pulse input and suitable control logic. The voltage-to-phase converter comprises a one-shot multivibrator in which the delay time is proportional to the input signal level. Thus, the periods between return times of the one-shot multivibrator to its original state provide a frequency which is controlled by input voltage level. When the phase-shift range exceeds $\pm 90°$, the trigger pulse to the one-shot multivibrator is advanced or delayed, and the integrator is reset to zero.

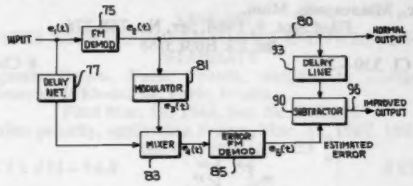
3,568,078

FM DEMODULATORS WITH SIGNAL ERROR REMOVAL

Guy Majella Pelchat, Indialantic, Fla., assignor to Radiation Incorporation, Melbourne, Fla.

Filed Dec. 23, 1968, Ser. No. 785,934
Int. Cl. H03d 3/00
U.S. Cl. 329—110 6 Claims

An FM demodulator system for improved reception of FM signals at low input signal-to-noise ratios by estimation of the error in the demodulated signal and subtraction of



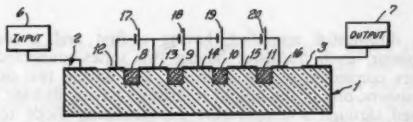
this estimated error from the demodulator output to provide a stronger output.

3,568,079

ACOUSTIC SIGNAL AMPLIFIER

Max N. Yoder, Washington, D.C., assignor to the United States of America, as represented by the Secretary of the Navy.

Filed Apr. 24, 1969, Ser. No. 819,059
Int. Cl. H03f 3/04
U.S. Cl. 330—5.5 4 Claims



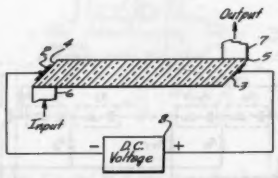
There is disclosed a microwave ultrasonic amplifier employing a piezoelectric semiconductor element fabricated with alternate amplifying and insulating sections. The insulating sections are included to periodically attenuate undesired, higher frequency, out of band phonon signals which would otherwise build up and saturate the amplifier. The coherent signals, because of their lower frequency, are not appreciably attenuated in these sections and, consequently, their amplitude is progressively increased in each amplifying section.

3,568,080

SELF-TRANSDUCING ULTRASONIC AMPLIFIER

Ronald R. Troutman, Rustic Drive, Essex Junction, Vt. 05452

Filed July 23, 1969, Ser. No. 844,130
Int. Cl. H03f 3/04
U.S. Cl. 330—5.5 5 Claims



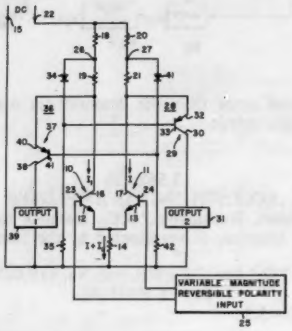
There is disclosed an ultrasonic amplifier for use with microwave signals which does not require transducer elements. A piezoelectric semiconductor element containing current carriers cooperates with a pair of waveguide sections. The microwave signal at the end of one of these sections generates an acoustic signal in the piezoelectric semiconductor element which is amplified by drifting current carriers as it travels down the element. The acoustic signal thereafter excites an electromagnetic signal at the start of the other waveguide section.

3,568,081

DIFFERENTIAL AMPLIFIER WITH PREDETERMINED DEADBAND

Balthasar H. Pinckaers, Edina, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 9, 1968, Ser. No. 758,276
Int. Cl. H03f 3/68
U.S. Cl. 330—30 6 Claims



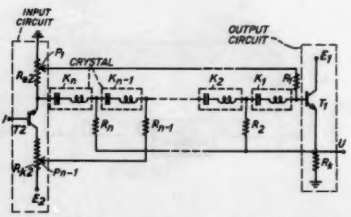
A differential amplifier, having a first and a second transistor, each transistor having two series-connected resistors connected to the collector, and having two output transistors; one of the output transistors having its base connected through a temperature compensating diode to the junction of the two resistors which are connected to the collector of the first differential amplifier transistor, and having its emitter connected to the collector of the second differential amplifier transistor; and the other of the output transistors having its base connected through a temperature compensating diode to the junction of the two resistors which are connected to the collector of the second differential amplifier transistor, and having its emitter connected to the collector of the first differential amplifier transistor.

3,568,082

ACTIVE CRYSTAL FILTER WITH A TRANSFER FUNCTION OF A WANTED DEGREE

Tore Torstensson Fjallbrant, Fjaras, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Sept. 3, 1968, Ser. No. 757,057
Claims priority, application Sweden, Sept. 11, 1967, 12,526/67
Int. Cl. H03f 3/04
U.S. Cl. 330—31 7 Claims



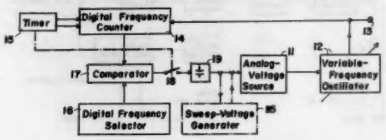
An active band pass filter includes a plurality of serially connected crystals which connect the input of the filter to an emitter-follower amplifier. A first plurality of resistors connected at alternate junctions of the crystals to the output of the amplifier and a second plurality of resistors connect the remaining junctions of the crystals to a signal level means which has a level different from the output of the amplifier.

3,568,083

VARIABLE FREQUENCY GENERATOR WITH TIMER-CONTROLLED AUTOMATIC FREQUENCY CONTROL LOOP

Peter Harzer, Eningen Unter Achalm, Germany, assignor to Wandel U. Goltermann Elektronische Prazisionsmessgerate, Reutlingen, Germany

Filed Oct. 23, 1968, Ser. No. 770,001
Claims priority, application Germany, Oct. 24, 1967, P 15 91 819.1
Int. Cl. H03b 3/04
U.S. Cl. 331—4 7 Claims



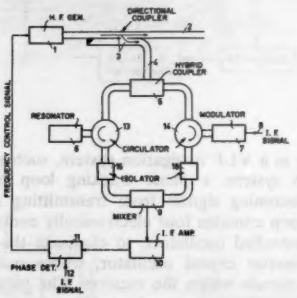
Decadic frequency generator wherein the output of an adjustable oscillator is evaluated in a digital frequency counter whose count, together with a signal from a manually settable digital frequency selector, is applied to a comparison circuit; in response to any disparity between the count and the selector signal, an analogue voltage is applied to a control circuit of the oscillator to effect a corrective adjustment.

3,568,084

CIRCUIT FOR CONTROLLING THE FREQUENCY OF A HIGH FREQUENCY GENERATOR

Maximiliaan Hubert Bodmer, Hengelo, Netherlands, assignor to N. V. Hollandse Signaalapparaten, Hengelo, Netherlands

Filed Dec. 26, 1968, Ser. No. 787,047
Claims priority, application Netherlands, Jan. 4, 1968, 6800097
Int. Cl. H03b 3/04
U.S. Cl. 331—9 10 Claims



The output of an oscillator is applied to two transmission paths having equal electrical and physical lengths. The first path contains a resonator of a selected frequency; the second path an I. F. modulator. The outputs of the two paths are mixed and then phase detected producing a signal which controls the frequency of the oscillator, setting it to the selected frequency.

3,568,085

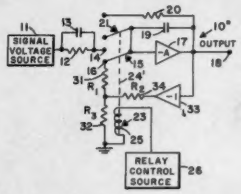
FREQUENCY SHORT INTERVAL SAMPLE AND LONG PERIOD FREQUENCY HOLD CIRCUIT

Vladimir J. Pimenoff, Scarborough, Ontario, Canada, assignor to Collins Radio Company of Canada Ltd., Cedar Rapids, Iowa

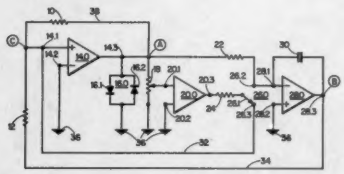
Filed Oct. 7, 1968, Ser. No. 765,335
Int. Cl. H03b 3/04; H03f 1/34, 3/68
U.S. Cl. 331—14 11 Claims

A frequency determined voltage short interval sample and long period frequency hold circuit with a dual feedback am-

plifier circuit alternatively switchable between a first feedback path with simultaneous connection for sampling an input signal voltage and a second feedback path for relatively long hold intervals; and with the first feedback path providing normal gain during the relatively short sample intervals and with the second feedback path including an amplifier and providing substantially zero gain around the amplifier loop.

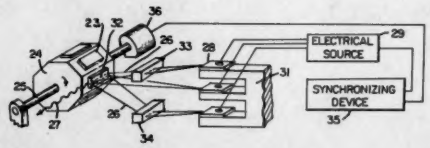


3,568,086
OSCILLATOR SYSTEM
Kenneth E. Perry, Wayland, Mass., assignor to EG & G International, Inc., Bedford, Mass.
Filed May 29, 1969, Ser. No. 828,930
Int. Cl. G01n 27/18
U.S. Cl. 331—65 **6 Claims**



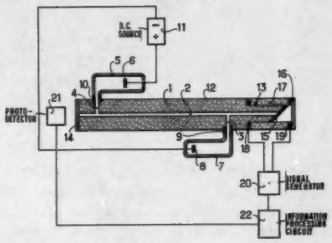
An oscillator system embodying a zero-crossing detector and a ramp generator, the combination connected to provide either a frequency or a period measurement that varies substantially proportionally with the setting of a sensor or other attenuating device.

3,568,087
OPTICALLY PUMPED SEMICONDUCTOR LASER
Robert J. Phelan, Jr., Concord, Mass., and Robert H. Rediker, Newton, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.
Filed July 16, 1965, Ser. No. 472,536
Int. Cl. H01s 3/18
U.S. Cl. 331—94.5 **1 Claim**



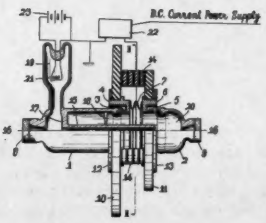
A semiconductor laser is provided including a body of semiconductor material enclosed within an optical cavity the reflectors of which may be formed by the ends of the body and an intense beam of electromagnetic energy is directed to at least a portion of the body of semiconductor material between the reflectors, the intensity being sufficient to produce an inverted population of energy states within the material accompanied by direct transitions of energy states from an elevated state to a lower state producing radiation which is amplified within the optical cavity by the process of stimulation producing a beam of coherent radiation which is launched from the body.

3,568,088
LASER WITH IMPROVED POWER AND FREQUENCY STABILITY
Benjamin Dessus, Paris, France, assignor to Compagnie Generale D'Electricite, Paris, France
Filed Mar. 18, 1968, Ser. No. 713,676
Claims priority, application France, Mar. 31, 1967, 101126
Int. Cl. H01s 3/10
U.S. Cl. 331—94.5 **4 Claims**



In a laser consisting of a quartz laser tube closed at the anode end by a mirror normal to the tube axis and at the cathode end by a glass plate having parallel faces and defining with the axis of the tube an angle equal to the Brewster angle, a second mirror disposed normal to the axis of the tube at the cathode end and fixed thereto by a sleeve fitted to the quartz tube.

3,568,089
INTERNAL MIRROR GAS LASER DISTANCING APPARATUS, LOW VOLTAGE STABLE DISCHARGE DEVICE, AND FREQUENCY MODULATION MEANS
Keiichi Tanaka, Tokyo, Japan, assignor to Agency of Industrial Science & Technology, Chiyoda-ku, Tokoyo, Japan
Filed July 8, 1968, Ser. No. 743,154
Claims priority, application Japan, July 11, 1967, 42/44155
Int. Cl. G01b 9/02
U.S. Cl. 331—94.5 **4 Claims**



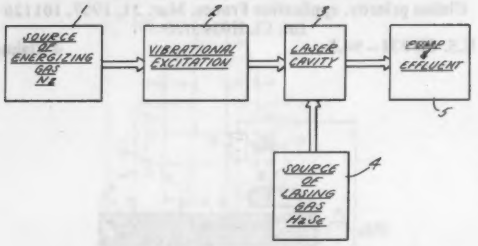
An apparatus for use in a gas laser having internal mirrors comprising an electric discharge tube, a cathode chamber operatively connected with one end of the electric discharge tube, an anode chamber operatively connected to the other end of the discharge tube, and two reflecting mirrors one mounted on the wall of the cathode chamber and the other on the wall of the anode chamber and aligned opposite one another in the direction of the axis of the electric discharge tube. An anode means forms the wall of the anode chamber and surrounds the other end of the electric discharge tube and varies the length of the anode chamber in the axial direction. Means are provided for varying the length of the anode means.

3,568,090

NITROGEN-HYDROGEN SELENIDE LASER (U)

Barry R. Bronfin, Weathersfield, Conn., and Daniel J. Seery, Glastonbury, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Dec. 23, 1968, Ser. No. 786,490
Int. Cl. H01s 3/22
U.S. Cl. 331—94.5 3 Claims



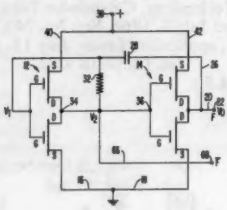
A gas laser utilizes vibrationally excited nitrogen as an energizing gas and, through resonant collisions with a lasing gas, transfers the energy to the lasing gas, preferentially to an upper laser energy level. The lasing gas is, hydrogen selenide, which is preferably introduced directly into the laser cavity free of prior excitation so as to avoid molecular dissociation. Laser energy at 7.86 and 49.6 microns is produced.

3,568,091

ASTABLE MULTIVIBRATOR USING TWO COMPLEMENTARY TRANSISTOR PAIRS

Charles H. Rahe, II, Lancaster, Pa., assignor to Hamilton Watch Company, Lancaster, Pa.

Filed Feb. 26, 1969, Ser. No. 802,571
Int. Cl. H03b 5/36; H03k 3/282
U.S. Cl. 331—113 18 Claims



Disclosed is a multivibrator for use as a time standard in a wristwatch or other small timepiece. The multivibrator comprises a pair of inverters each including complementary insulated gate field effect transistors. When one transistor in an inverter switches on the other switches off, thus minimizing power drain. A simplified single timing circuit controls the multivibrator half periods and the multivibrator may be synchronized with the natural frequency or some subharmonic of a quartz crystal.

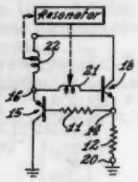
3,568,092

OSCILLATOR DRIVER

Ronald P. Kluss, Santa Barbara, Calif., assignor to Spectrum Technology, Inc., Goleta, Calif.

Continuation-in-part of application Ser. No. 694,726, Jan. 2, 1968. This application Mar. 17, 1970, Ser. No. 20,306
Int. Cl. H03b 5/36
U.S. Cl. 331—116 7 Claims

A circuit for use as regenerative drive circuit for a mechanical resonator, using two complementary transistors, the base of each connected to the emitter of the respective other one for forming a loop which includes a sensing coil. The collector-emitter path of one of the transistors includes a drive coil.

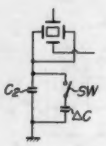


3,568,093

TEMPERATURE COMPENSATED OSCILLATOR USING TEMPERATURE CONTROLLED CONTINUAL SWITCHING OF FREQUENCY DETERMINING IMPEDANCE

Fujio Ishida, Kokubunji-shi, and Yoshiaki Kato, Higashimurayama-shi, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Dec. 23, 1968, Ser. No. 786,153
Claims priority, application Japan, Jan. 31, 1968, 43/5921
Int. Cl. H03b 3/04, 5/36
U.S. Cl. 331—116 6 Claims



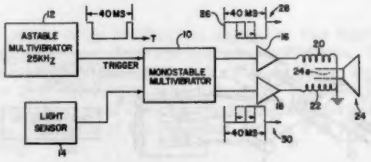
Method of and device for compensating the temperature variation in the oscillation frequency of an oscillator wherein an impedance element, for example, a capacitor coupled to the oscillator is switched between two levels of its value, whereby the temperature variation is compensated for on an average.

3,568,094

PULSE WIDTH MODULATOR

Lenard M. Metzger, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 23, 1968, Ser. No. 754,933
Int. Cl. H03k 7/08
U.S. Cl. 332—9 7 Claims



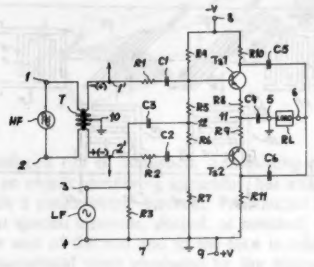
A pulse width modulation sound reproduction system includes a monostable multivibrator which is switched at the beginning of each cycle of a super-audio input provided by an astable or free-running multivibrator. An audio frequency input determines the time during which the monostable multivibrator remains in its unstable state; the output of the monostable multivibrator is fed to a loudspeaker. In one embodiment, logic circuitry connected between the outputs of the astable and monostable multivibrators disconnects the load when the input is below a predetermined level so as to increase the efficiency of the system.

3,568,095

SELF-BALANCING MODULATOR FOR SUPPRESSION OF CARRIER WAVE

Giovanni Cordalis, Milan, Italy, assignor to Societa' Italiana Telecommunicazioni Siemens S. p. A., Milan, Italy

Filed Oct. 16, 1968, Ser. No. 768,055
Claims priority, application Italy, Oct. 19, 1967, 21756-A/67
Int. Cl. H03c 3/26, 1/52
U.S. Cl. 332—24 7 Claims



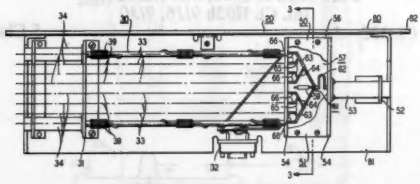
Two transistors of opposite conductivity types are connected back-to-back, with their emitters confronting each other, across a source of DC driving voltage for push-pull energization by a carrier wave and parallel energization by an applied low frequency modulating signal. A condenser connected to the junction of the two emitter leads differentially biases the transistors to compensate for unsymmetrical conductivity.

3,568,096

APPARATUS FOR AUTOMATICALLY SWITCHING HIGH FREQUENCY SIGNALS

Ronald W. Kordos, North Andover, Mass., and Thomas A. McCurdy, Columbus, Ohio, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Aug. 11, 1969, Ser. No. 848,951
Int. Cl. H01p 5/12, 3/08; H03h 7/38
U.S. Cl. 333—7 14 Claims



A device for establishing a high frequency signal conducting path between two groups of transmission lines is disclosed which contains cable switches and a strip line assembly. Both the cable switches and the strip line assembly are joined to each other at one end and at the opposite end one is joined to one transmission line group while the other is joined to the second transmission line group.

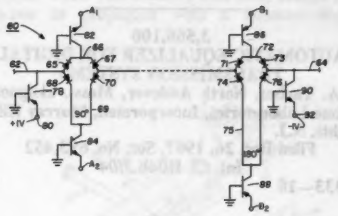
3,568,097

SWITCHED LINE LENGTH PHASE SHIFT NETWORK FOR STRIP TRANSMISSION LINE

Tom M. Hyltin, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of application Ser. No. 805,900, Mar. 10, 1969, which is a continuation of application Ser. No. 606,425, Dec. 30, 1966. This application Nov. 18, 1969, Ser. No. 871,677
Int. Cl. H01p 1/10, 1/18
U.S. Cl. 333—7 4 Claims

A diode switched line length phase shift network utilizing alternately directed diodes to reduce the number of DC biasing paths required to selectively switch the line length in various combinations into the circuit and the utilization of the



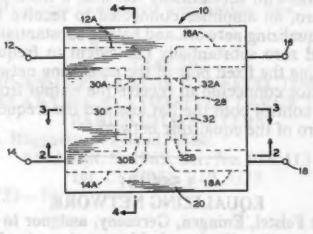
low capacitance and high dynamic collector resistance of a transistor to apply a DC bias to the switching diodes of the phase shift circuit.

3,568,098

MICROWAVE STRIPLINE DEVICES

Carl W. Gerst, Skaneatles, N.Y., assignor to Anaren Microwave, Incorporated, Syracuse, N.Y.

Filed June 23, 1969, Ser. No. 835,693
Int. Cl. H01p 5/14
U.S. Cl. 333—10 3 Claims



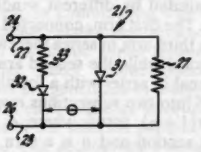
There is disclosed microwave stripline devices wherein a pair of parallel striplike signal conductors electromagnetically coupled and in one plane and a planar field modifying element in another plane are disposed between a pair of spaced ground plane elements. In one variation, signal terminals are connected to each end of each signal conductor to provide a backward wave coupler. In another variation signal terminals are connected to one end of each signal conductor, respectively, and the other ends of each signal conductor are interconnected to provide a phase shifter.

3,568,099

MATCHED MICROWAVE LIMITER

Gene Chao, Menlo Park, Calif., assignor to Textron, Inc., Belmont, Calif.

Filed Apr. 21, 1969, Ser. No. 817,646
Int. Cl. H04b 3/04; H03h 7/38; H01n 1/22
U.S. Cl. 333—17 6 Claims



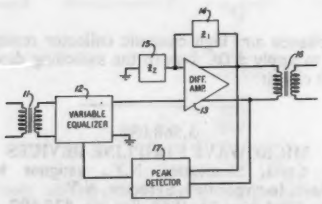
An improved limiter for microwave circuits to remove voltage applied to a load when the voltage amplitude exceeds a predetermined value without reflections in the circuit. A pair of voltage sensitive switches are connected across a circuit with one switch in series with an insert impedance sub-

stantially equal to line impedance. The switches are separated by an impedance inverter to effectively apply a very large impedance across the insert impedance to prevent R-F reflection in the limiting mode.

3,568,100
AUTOMATIC EQUALIZER FOR DIGITAL TRANSMISSION SYSTEMS

Richard A. Tarbos, North Andover, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkely Heights, N.J.

Filed Dec. 26, 1967, Ser. No. 693,452
Int. Cl. H04b *3/04*
U.S. Cl. 333—18 **7 Claims**

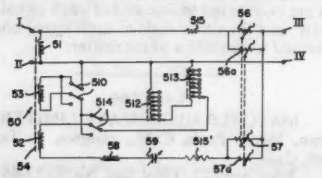


An automatic equalizer for digital transmission systems includes a variable equalizing network having a transfer characteristic with substantially flat loss, a fixed pole, and a variable zero, an amplifier connected to receive the output from the equalizing network and having substantially flat gain and a fixed zero substantially coincident in frequency with and canceling the fixed pole of the equalizing network, and a peak detector connected to receive the output from the amplifier and control both the flat loss and the frequency of the variable zero of the equalizing network.

3,568,101
EQUALIZING NETWORK

Karl Heinz Feistel, Eningen, Germany, assignor to Wandel u. Goltermann Rundfunk-und Messgeratewerk, Fernmelde-Anlagen, Postfach, Reutlingen, Germany

Filed Apr. 28, 1969, Ser. No. 819,894
Claims priority, application Germany, Apr. 27, 1968, P 17 62 201.4
Int. Cl. H03h *5/08, 7/10, 9/00*
U.S. Cl. 333—28 **10 Claims**

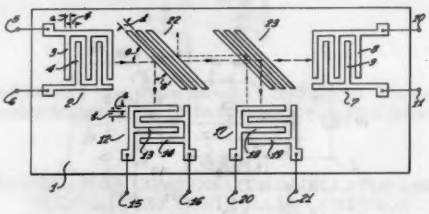


An equalizing network for correcting delay and amplitude distortions has four bridge arms, including a first arm and a second arm constituted by different winding sections of an auto transformer. The first arm, connected across a source of input signal and a third arm in series therewith lie on one side of an output diagonal while the second arm lies on the other side of that diagonal in series with a fourth arm. The second arm is subdivided into two subsections respectively provided with $n\eta$ and $un(1+\eta)$ turns where n is the number of turns of the first section and u is a turn ratio related to a desired degree of attenuation to be introduced. The third and fourth arms include respective resistors R_1 and R_2 with magnitudes in the $R_2/R_1=\eta$ ganged for concurrent adjustment to vary the phase shift, a tunable resonant circuit being included in one of these latter arms in the form of either a series-resonant circuit in line with R_2 or a parallel-resonant circuit in shunt with R_1.

3,568,102
SPLIT SURFACE WAVE ACOUSTIC DELAY LINE

Chin Chong Tseng, San Carlos, Calif., assignor to Litton Precision Products, Inc., San Carlos, Calif.

Filed July 6, 1967, Ser. No. 651,530
Int. Cl. H03h *7/30*
U.S. Cl. 333—30 **17 Claims**



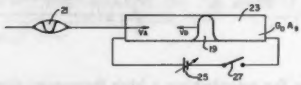
An acoustic delay line having an input and a plurality of output transducers is provided which includes at least one reflective grating, a plurality of adjacent spaced conductive strips, coupled to the surface of a piezoelectric layer for splitting an acoustic surface wave traveling across the surface of the piezoelectric layer into two components, one of which continues to travel in the original direction and the other of which travels skew to that direction. Each of the original and reflected portions are detected by the output transducers.

Significantly, the reflective grating affords the basis for multiple output delay lines of various apparent applications, of structural simplicity and of minimal interference between input and output transducers.

3,568,103
A SOLID STATE ACOUSTIC VARIABLE TIME DELAY LINE

Thomas M. Fitzgerald, Framingham, Mass., assignor to the United States of America as represented by the administrator of the National Aeronautics and Space Administration

Filed Sept. 6, 1968, Ser. No. 757,857
Int. Cl. H03h *9/16, 9/30*
U.S. Cl. 333—30 **5 Claims**

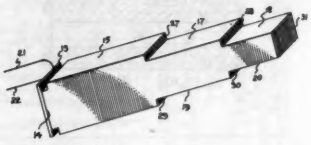


This disclosure describes a solid-state variable time delay line. A DC voltage applied to the longitudinal axis of piezoelectric material creates a high field domain that propagates along said axis from one end of the material to the other end. An RF pulse is applied to the end of the material toward which the high field domain is traveling. The RF pulse generates an acoustic wave that travels toward the high field domain. When the acoustic wave reaches the high field domain, it is reflected by the moving high field domain back toward the end of the material to which the RF pulse is applied. The total time delay is the time it takes for the acoustic wave to reach the high field domain and be reflected back to the RF input end of the material. Hence, by varying the time relationship between the creation of the moving high field domain by the DC voltage and the application of the RF pulse, a variable time delay is provided.

3,568,104
SONIC DELAY LINE DEVICE

Francis M. Bailey, Roanoke, Va., assignor to General Electric Company

Filed Dec. 20, 1968, Ser. No. 785,520
Int. Cl. H03h 9/30; H03k 13/00
U.S. Cl. 333—30 5 Claims

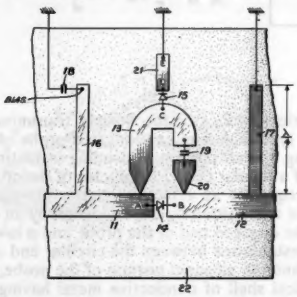


A multifaced rod of acoustical transmitting material, for use with an object identifying apparatus, has attached to one of its ends a piezoelectric element. Preselected faces of the rod are at spaced intervals, slotted, or notched, perpendicular to the axis of the rod and to the face in which they are cut. An acoustical wave produced by the piezoelectric element in response to an electrical signal is reflected by each of the notches in turn. The resulting echoes are received by the piezoelectric element which in response thereto produces a coded representation of the identity of the object to be identified.

3,568,105
MICROSTRIP PHASE SHIFTER HAVING SWITCHABLE PATH LENGTHS

Robert A. Felsenheld, Livingston, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Mar. 3, 1969, Ser. No. 803,793
Int. Cl. H01p 1/10, 1/18
U.S. Cl. 333—31 8 Claims



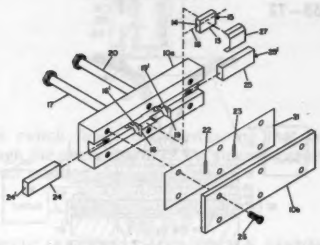
A microstrip phase shifter is inserted in a waveguide aperture, the phase shifting network consists of lightweight transmission line sections which can be switched by microwave diodes to provide the required phase shift. The diodes are switched in pairs, forward or back biased, so that the wave will traverse through a given path to complete the phase shifting according to the switched pair of the diodes.

3,568,106
MAGNETOSTATIC DELAY LINE

Richard La Rosa, South Hempstead, and Carmine F. Vasile, Greenlawn, N.Y., assignors to Hazeltine Corporation

Filed Sept. 17, 1969, Ser. No. 858,587
Int. Cl. H03h 7/30 H01o 9/00
U.S. Cl. 333—31 13 Claims

A wide band magnetostatic delay line having a sample of single crystal yttrium iron garnet (YIG) positioned in an axial bias field. The YIG sample is enclosed in a cutoff waveguide and separated from the walls of the guide by several guide wavelengths, measured in the YIG sample. The input and output probes are backed up by polycrystal YIG pieces which cause the bias field to be substantially uniform in the single crystal YIG. The uniform bias field causes a magnetostatic wave to propagate with a substantially constant

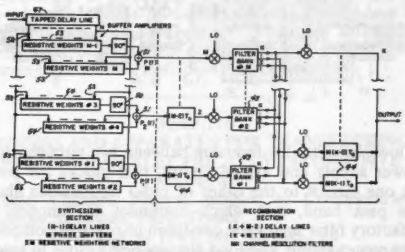


wavelength. The polycrystal YIG backup pieces also serve to provide substantially uniform permeability to the electromagnetic fields associated with the input and output probes in order to provide efficient coupling over a wide bandwidth. Longer delays are made possible by cascading several single crystal YIG pieces along their longitudinal axis.

3,568,107
METHOD AND APPARATUS FOR EFFECTING TAPPED DELAY LINE SYNTHESIS OF LARGE TIME BANDWIDTH FILTERS

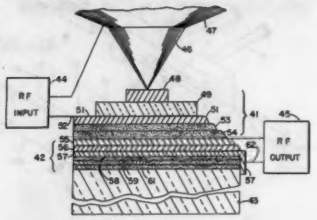
Ronald D. Haggarty, Wayland, Mass.

Filed Sept. 9, 1969, Ser. No. 856,413
Int. Cl. H03h 7/10, 7/38
U.S. Cl. 333—70 7 Claims



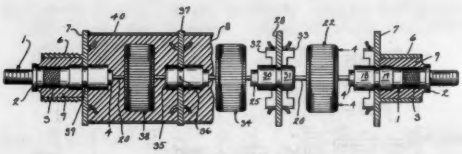
The present invention comprehends a method and apparatus for the design of large time bandwidth product linear filters by tapped delay line filter synthesis techniques. A periodic transfer function is selected which has a linear time delay characteristic and an amplitude versus frequency characteristic which, in combination with like transfer functions in proper phase relationship produces a filter with a constant resultant amplitude versus frequency characteristic and a linear time delay characteristic. A plurality of sequences of pulses are generated by a tapped delay line. The number of pulses in each sequence is equal to the number of Fourier harmonics of the selected periodic transfer function. They are weighted with appropriate Fourier coefficients and are combined to form a plurality of synthesized periodic transfer functions that conform to the selected transfer function. The synthesized periodic transfer functions are divided into constituent components defined by various frequency bands (or periods). The constituent components are relatively delayed and recombined to effect the composite filter having an extremely large time bandwidth product.

3,568,108
THIN FILM PIEZOELECTRIC FILTER
Armand R. Poirier, Nashua, N.H., and Terry F. Newkirk, Lynnfield, Mass., assignors to Sanders Associates, Inc., Nashua, N.H.
Original application July 24, 1967, Ser. No. 655,461, now Patent No. 3,422,371. Divided and this application May 31, 1968, Ser. No. 751,635
Int. Cl. H03h 9/26
U.S. Cl. 333—72 5 Claims



A thin film piezoelectric filter comprises a plurality of coaxially disposed resonators; each having a different but overlapping frequency-amplitude characteristic. The individual resonators are separated from one another by a selectively transmissive structure such that high-frequency acoustic waves produced in a first resonator are coupled in part to an adjacent resonator.

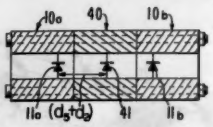
3,568,109
VARIABLE OR LOW PASS FILTER
Richard F. Neuens, Silver Spring, Md., assignor to Allen-Bradley Company, Milwaukee, Wis.
Filed May 2, 1968, Ser. No. 725,979
Int. Cl. H03h 5/06
U.S. Cl. 333—79 8 Claims



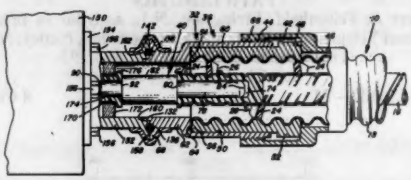
A low pass filter for insertion between two circuits, such as a power supply and a load circuit, that blocks the passage from one circuit to the other of radio frequencies above a given pass band, and which continues to function as a satisfactory filter under the condition of reactive components in the power supply and load circuits being close to resonant values with reactive elements in the filter. The filter comprises a π network having a series line extending between the network input and output ends that includes an inductive circuit element, and shunt lines branching from the series line that include capacitive elements with resistance to establish resistance-capacitance elements that introduce circuit losses which reduce the Q of the shunt lines to inhibit resonances that might otherwise impair the filtering function of the device.

3,568,110
MODULAR POWER COMBINING TECHNIQUES USING SOLID STATE DEVICES FOR DC-TO-RF ENERGY CONVERSION
Ferdo Ivanek, Palo Alto, Calif., assignor to Fairchild Camera and Instrument Corporation, Syosset, Long Island, N.Y.
Filed June 16, 1969, Ser. No. 833,264
Int. Cl. H01p 7/06; H03f 3/00
U.S. Cl. 333—83 11 Claims

Microwave power sources capable of operating over different frequency ranges and each containing a plurality of active solid state devices for direct conversion of DC energy to RF energy, are constructed by tandemly-connecting power source modules selected from a limited number of module types. Each module, which is merely bolted to adjacent modules, possesses a microwave cavity containing a single symmetrically or asymmetrically mounted active solid state device.



3,568,111
CONNECTOR FOR FLEXIBLE TRANSMISSION LINE
Philip H. Dyer, Stow, and Bernard Waters, Natick, Mass., assignors to Raytheon Company, Lexington, Mass.
Filed Oct. 1, 1968, Ser. No. 764,154
Int. Cl. H01p 3/06
U.S. Cl. 333—97 7 Claims

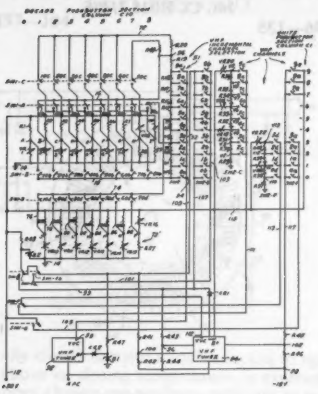


An electrical connector for flexible transmission lines of the coaxial type including an elongated probe of conductive metal having an end portion protruding insulatingly into the open end of a tubular center conductor of the coaxial line for a distance equal to an effective quarter wavelength of the energy to be transmitted by the line whereby an open circuit occurs at the engaged end of the probe and a low impedance junction is established between the circular end of the center conductor and the adjacent portion of the probe; and a coaxial, cylindrical shell of conductive metal having an internal shoulder clamped in direct metallic contact with a flanged end of the outer coaxial conductor.

3,568,112
DIGITAL PUSHBUTTON TUNING FOR SIGNAL-CONTROLLED RECEIVER
Ernest A. Thomas, West Springfield, Mass., assignor to General Instrument Corporation, Newark, N.J.
Filed Feb. 12, 1969, Ser. No. 798,648
Int. Cl. H03j 5/00, 5/14
U.S. Cl. 334—1 27 Claims

A tuner for a signal-controlled communication receiver is disclosed, in which a plurality of tuning signal levels are established at a series of terminals. Frequency selecting means comprising pushbutton controlled switch means is provided to selectively operatively connect one of said signal levels to the tuning varactor, thereby to tune the receiver to a desired frequency. The difference between the signal levels at each adjacent pair of terminals is such as to cause the varactor to tune in substantially equal frequency segments along the entire tuning range when signals corresponding to

each of the tuning signal levels are applied thereto. The pushbutton control may comprise two sets of pushbuttons, one

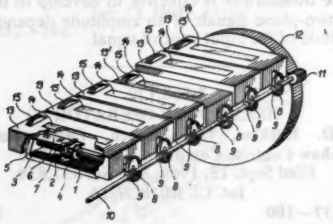


being effective to select the "tens" and the other to select the "ones" of the desired channel number.

3,568,113
VISUAL INDICATION MEANS FOR A PUSHBUTTON TUNER

Rudolf Hopt, and Rudolf Mayer, Rottweil, Germany, assignors to R & E Hopt KG, Rottweil, Germany

Filed Feb. 20, 1969, Ser. No. 801,106
Claims priority, application Germany, Feb. 22, 1968, P 16 16 268.8
Int. Cl. H03j *1/04, 5/32*
U.S. Cl. 334—7 **5 Claims**



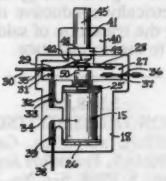
A tuning device of radio frequency communication equipment employs a plurality of tuning spindles with which are associated scales and tuning element pointers. A depressable key, through which each scale and pointer is visible, is arranged with each spindle to actuate a switch element for tuning the desired frequency channel.

3,568,114
MAGNETICALLY MAINTAINED ELECTRIC SWITCH

Walter L. Cherry, and Raymond G. Castle, Highland Park, Ill., assignors to Cherry Electrical Products Corporation, Highland Park, Ill.

Filed Oct. 15, 1969, Ser. No. 866,624
Int. Cl. H01h *45/02*
U.S. Cl. 335—202 **8 Claims**

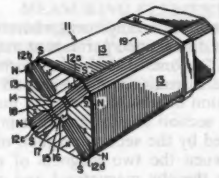
A switch initially actuated by a manually operated actuator that in turn moves a resilient switch finger into contact with a fixed terminal so as to establish a circuit therethrough. The actuator simultaneously depresses an armature into the core of an electromagnetic solenoid which by the closing of the switch finger becomes energized to be self-holding with the actuator being restored to its initial position by a spring carried by the switch finger notwithstanding that the switch finger through the energization of the solenoid remains in its closed contact position.



3,568,115
MAGNETIC MATERIAL MULTIPOLE ASSEMBLY

William Affleck Wolfe, Ontario, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Ontario, Canada

Filed Sept. 18, 1968, Ser. No. 760,565
Claims priority, application Canada, Nov. 10, 1967, 4,760
Int. Cl. H01t *7/00*
U.S. Cl. 335—210 **4 Claims**

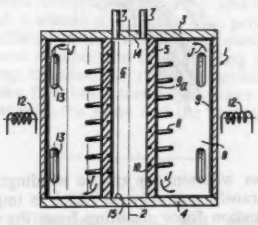


A multipole magnet, for example a quadrupole magnet for an ionic beam, comprises an equal number of ferrous poles of, say, barium or strontium ferrite, and magnetic material members arranged side by side to define a central aperture. The ferrous poles and magnetic material are arranged alternately around the central aperture so that their polarities cooperate to produce a multipole magnet field.

3,568,116
PROCESS AND APPARATUS FOR TRANSFERRING ENERGY TO AN ELECTRICALLY CONDUCTIVE MEDIUM

Jean Sole, Clamart, France, assignor to Commissariat A L'Energie Atomique, Paris, France

Filed Sept. 6, 1967, Ser. No. 665,772
Claims priority, application France, Sept. 7, 1966, PV75599
Int. Cl. H01f *1/08, 7/22;* **H01s** *3/09*
U.S. Cl. 335—216 **32 Claims**



A process and apparatus for transferring energy to an electrically conductive medium. The conductive medium is disposed in an inner chamber which is surrounded by an annular chamber having walls internally covered with a layer adapted to have superconductive properties. According to the present disclosure the layer is brought to a state of super-

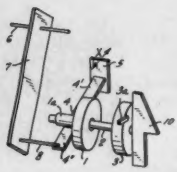
conductivity producing a current density in the superconducting layer, said trapped current across the superconducting layers producing a magnetic field in the annular chamber which corresponds to a given energy and transferring this energy into the electrically conductive medium in the inner chamber by causing the transition of said layers from the superconductive state to the normal state.

3,568,117

MAGNETIC MOTION TRANSMITTING ARRANGEMENT

Kurt Rossler, Frankfurt, am Main, Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 5, 1968, Ser. No. 773,546
Claims priority, application Germany, Nov. 7, 1967, P 16 50 643.7
Int. Cl. H01f 7/02
U.S. Cl. 335—306 **14 Claims**



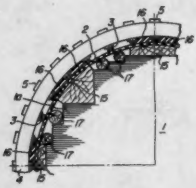
A motion transmitting arrangement wherein a first diametrically magnetized disc-shaped permanent magnet is movable axially toward a second disc-shaped permanent magnet, either in response to rotation of the second magnet from a first angular position in which the second magnet repels the first magnet to a second angular position in which the first magnet is attracted by the second magnet, or in response to introduction between the two magnets of a ferromagnetic member which is thereby magnetized and attracts the first magnet toward the second magnet. The arrangement can be used to release the carriage in a toaster in response to rotation of the second magnet or in response to displacement of the ferromagnetic member by a thermostat in the toasting chamber.

3,568,118

TRANSFORMER

Takashi Kuriyama; Kiyoto Hiraishi; Tadashi Kiuchi; Sho Kusumoto, and Shigeru Shida, Hitachi-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 14, 1969, Ser. No. 799,257
Claims priority, application Japan, Feb. 16, 1968, 43-9422
Int. Cl. H01f 27/08, 27/30
U.S. Cl. 336—60 **5 Claims**



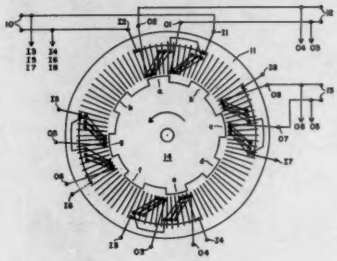
A transformer wherein one of the windings provided on the legs of a transformer core to which is imparted a centripetal compression force resulting from the winding-axial component of a leakage flux is effectively supported by said core legs substantially at Octo- to dodeca-sectional points in the circumferential direction of said winding, thereby increasing the buckling strength of said winding as the latter is buckled by a compression force which is generated therein due to short circuit trouble occurring in a system with which said transformer is connected.

3,568,119

DYNAMIC TRANSFORMER

Myron C. Ruderman, Plainview, N.Y., assignor to Aeroflex Laboratories Incorporated

Filed Aug. 26, 1969, Ser. No. 853,080
Int. Cl. H01f 21/06
U.S. Cl. 336—135 **4 Claims**



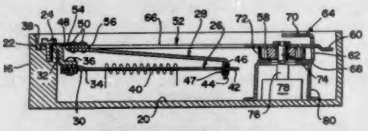
A dynamic transformer comprises input terminals for supplying an alternating-current control signal and an alternating current slotted-ring stator having two nondistributed exciting windings each of which comprises two equal diametrically opposed sections. Each winding section embraces a predetermined sector of the stator ring and the winding sections are equally spaced about the stator $360°/2n \pm \frac{1}{2}$ of the sector. The windings are excited in phase from input terminals. The transformer also comprises two distributed output windings on the stator ring, each winding comprising two equal diametrically opposed sections and each winding section embracing the same sector of the stator as one of the exciting winding sections and each output winding section being divided into two equal adjacent portions connected in series opposition. The transformer has a rotor of low-loss magnetic material having eight salient poles, each of the poles having a width approximately one-half of the aforesaid stator sector width. The transformer is effective to develop in the output windings two-phase signals of an amplitude dependent upon the amplitude of the input control signal.

3,568,120

HEATMOTOR OPERATOR

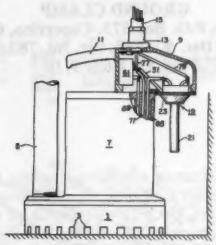
Lauren D. Haskins, Long Beach, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Sept. 15, 1969, Ser. No. 857,839
Int. Cl. H01h 71/16
U.S. Cl. 337—100 **14 Claims**



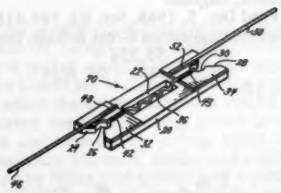
A heatmotor operator including a bimetal assembly having a bimetal motor arm and a bimetal compensating arm superposed above the motor arm, a lever having an operating end and a pivot end secured to one end of the compensating arm, the other end of the compensating arm being coupled with a movable end of the motor arm such that ambient temperature compensation is provided by the deflection of the motor arm and the compensating arm in the same direction, and actuating means for the bimetal assembly to control the position of the operating end of the lever.

3,568,121
THERMAL SWITCH ASSEMBLY AND SYSTEM
Floyd M. Nash, Little Rock, Ark., assignor to Jacuzzi Bros. Incorporated
Filed May 26, 1969, Ser. No. 827,576
Int. Cl. H01h *61/013*
U.S. Cl. 337—104 5 Claims



A normally closed thermal switch adapted to open at temperatures above its closing temperature, is exposed to a temperature above closing temperature sufficient to maintain the switch open in an atmospheric environment, but insufficient to maintain said switch open in a liquid environment, wherein the switch is caused to close. Closing of the switch introduces additional heat which is sufficient to open the switch while in such liquid environment, but capable of effecting a fast opening of the switch upon subsequent removal of the liquid environment and exposing the switch to the initial atmospheric environment. The switch assembly, when employed in a sump pump system, will reduce the continued running of the pump following completion of a pumping operation, to protect the motor against heat up damage, and economize on power consumption.

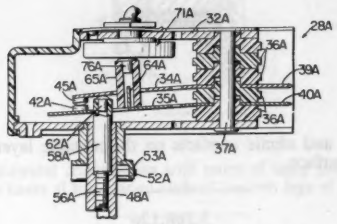
3,568,122
PROTECTOR FOR ELECTRIC CIRCUITS
Angelo Urani, St. Louis, Mo., assignor to McGraw - Edison Company, Elgin, Ill.
Filed Oct. 8, 1969, Ser. No. 864,672
Int. Cl. H01h *85/54*
U.S. Cl. 337—166 15 Claims



The fragile fusible element of a low amperage electric fuse is protected by being mounted adjacent a longitudinally extending central opening within a support and by being made so it is undulatory in configuration.

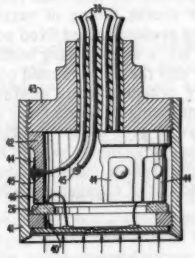
3,568,123
ELECTRICAL THERMOSTAT AND PARTS THEREFOR OR THE LIKE
Denis G. Wolfe, Greenburg; Francis S. Genbauffe, Irwin, and Gerald H. Eicher, Alverton, Pa., assignors to Robertshaw Controls Company, Richmond, Va.
Original application Oct. 3, 1967, Ser. No. 672603, now Patent No. 3,469,779. Divided and this application Apr. 14, 1969, Ser. No. 840,569
Int. Cl. H01h *37/24, 37/40*
U.S. Cl. 337—318 12 Claims

An electrical thermostat for a fuel control system of a domestic oven including a housing carrying a pair of switch blades and a condition responsive means having a part movable relative to the housing. A post is disposed between and in engagement with the movable part of the condition responsive means and one of the switch blades. The post engages



the movable part and one of the switch blades in a manner to cause abrupt opening of the switch blade contacts by a sidewise skipping of the port relative to the movable part.

3,568,124
PIEZORESISTIVE FORCE- AND PRESSURE-MEASURING ELEMENT
Hans Conrad Sonderegger, Winterthur, Switzerland, assignor to Kistler Instrument AG, Winterthur, Switzerland
Filed May 31, 1968, Ser. No. 734,646
Claims priority, application Switzerland, June 1, 1967, 7784/67
Int. Cl. G01l *1/22*
U.S. Cl. 338—4 16 Claims

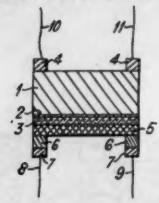


A piezoresistive element for pressure- and force-measurements in which a silicon disc or the like, provided with resistive paths diffused in the same is supported on a metallic support ring, and in which an insulator ring is mounted on the support ring; the insulator ring is provided with contact lands or the like from an intermediate stage and thin wire connections between the same and the contact lands in the resistive paths.

3,568,125
THERMISTOR
Claude Marie Villemant, Paris, and Michel Gaultier, Gif/Yvette, France, assignors to International Standard Electric Corporation
Filed Oct. 14, 1968, Ser. No. 767,930
Claims priority, application France, Oct. 20, 1967, 125,231
Int. Cl. H01c *7/04*
U.S. Cl. 338—22 10 Claims

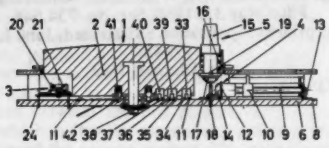
A thermistor is formed of a semiconductor body having a

layer of glass on one surface, a metallic resistance layer on



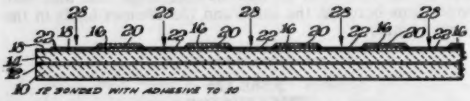
the glass and ohmic contacts on the metallic layer and on another surface.

3,568,126
TUNING ARRANGEMENT FOR STORABLE STATION SELECTION IN TELEVISION RECEIVERS
Ulrich Armonier, Simmelsdorf; Norbert Aberger, and Helmut Rolf, Nurnberg, Germany, assignors to International Standard Electric Corporation, New York, N.Y.
Filed Dec. 10, 1968, Ser. No. 782,576
Claims priority, application Germany, Dec. 27, 1967, P 15 91 599.8
Int. Cl. H01c *1/12, 9/02*
U.S. Cl. 338—129 **6 Claims**



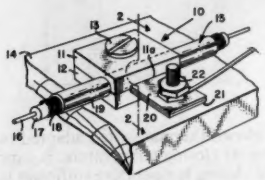
A tuning arrangement for television receivers including a rotatable knob for coarse tuning of various stations to be received and having predetermined fixed positions into which said knob may be set, a single tuning button having beveled gear means at one end thereof mounted on said knob, a plurality of stationary potentiometers mounted concentrically with said knob, one being opposite each of said fixed positions, and each having gear means associated therewith for engagement with, and adjustment by, said button, said button further having spring return means enabling movement of said button into and out of engagement with the potentiometers.

3,568,127
ELECTRICAL RESISTORS
Bruno R. Aimi, Burlington, Vt., assignor to Sprague Electric Company, North Adams, Mass.
Filed Oct. 28, 1968, Ser. No. 771,102
Int. Cl. H01c *1/02*
U.S. Cl. 338—262 **14 Claims**



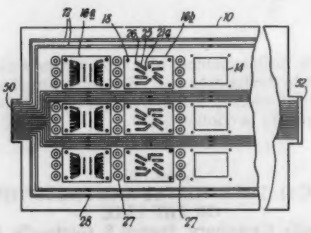
In forming a plurality of resistor components a resistive metal film is deposited on an inert, electrically nonconductive base. Parallel electrode strips are deposited on the resistive film and parallel overglaze strips are deposited on the resistive film between and slightly overlapping the electrode strips. This structure is separated into a plurality of resistor components by making a series of parallel cuts down through all the layers along lines at right angles to a line following the longitudinal axis of said glaze strips; annealing the structure to refuse the overglaze; and performing a second series of parallel cuts at right angles to said first cuts and following lines midway of said electrodes strips.

3,568,128
GROUND CLAMP
George W. Taylor, P.O. Box 573, Cupertino, Calif.
Filed Dec. 9, 1968, Ser. No. 782,395
Int. Cl. H01r *9/10*
U.S. Cl. 339—14 **1 Claim**



A ground clamp for making a ground connection to the sheath of a coaxial cable. The ground clamp is provided with relatively wide metal clamping members having arcuate portions for clamping the metal sheath therebetween after the outer insulation is stripped from the cable and the sheath is exposed. These portions of the ground clamp cable are enclosed in a plastic housing which is made of two identical sections that are adapted to be held together by the anchoring screw. The housing sections are provided with inwardly extending ridges that engage the outer plastic coating of the cable to form seals therewith and prevent moisture from entering the housing.

3,568,129
DEVICE FOR FACILITATING THE TESTING OF EXPERIMENTAL CIRCUITS
Percy Ernie Gold, 53 Nascat Wood Road, Watford, Hertfordshire, and Harold E. J. Kemp, 38 School Road, Ashford, Middlesex, England
Filed Dec. 5, 1968, Ser. No. 781,418
Claims priority, application Great Britain, Dec. 5, 1967, 55,334
Int. Cl. H05k *1/04, 3/36*
U.S. Cl. 339—17 **9 Claims**



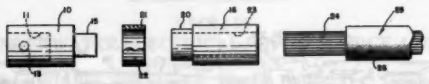
The invention resides in a circuit board for receiving a plurality of integrated circuits in order that the integrated circuits can be patched up in various arrangements as desired, some at least of the integrated circuit receiving stations are removable from the board so that they can be interchanged with stations for receiving different types of integrated circuit.

3,568,130

ELECTRICAL CONNECTOR FOR ALUMINUM CABLE

Albert J. Hurst, Milford, Ohio, assignor to KDI Sealtron Corporation

Filed Apr. 7, 1969, Ser. No. 813,863
Int. Cl. H01r 13/20, 11/08
U.S. Cl. 339—30 8 Claims



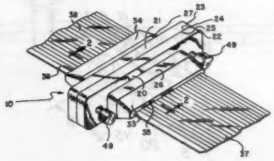
An electrical connector of one material such as a copper alloy may be secured to a cable of a different material such as aluminum in an assembly which will resist loosening under heat, by securing the conductive strands of the cable within the internal bore of a tube of material akin to the material of the cable strands, and also disposing a portion of the connector within such internal bore, while a reinforcing ring is exteriorly disposed about said sleeve in the vicinity where the connector portion is located.

3,568,131

ELECTRICAL CONNECTOR

Bobby W. Kennedy, 1112 4th Ave. NW., Arab, Ala. 35016

Filed Nov. 26, 1969, Ser. No. 880,247
Int. Cl. H01r 13/50, 33/04; H05k 7/00
U.S. Cl. 339—45 8 Claims



A rectangular-shaped connector for flat conductor cables includes a pair of elongated rectangular insulating blocks having pin and socket contacts disposed in opposing spaced apertures. The blocks are encased by mating, flat-faced housings through which the cable conductors extend, the exposed ends of insulated conductors being joined to the contacts. Housing ends are enclosed by potting boots sealed to the conductor insulation. Hermetic sealing and avoidance of arcing are realized by filling void spaced with a potting material, in particular, "CNR" resin for service under extreme conditions, and by providing a seal of such material between the housings.

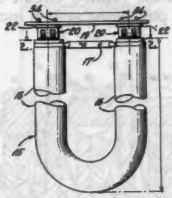
3,568,132

SELF-ADJUSTING LAMPHOLDER FOR U-SHAPED FLUORESCENT LAMP

George E. Johnson, Bronxville, N.Y., assignor to Leviton Manufacturing Co., Inc., Brooklyn, N.Y.

Filed Nov. 13, 1968, Ser. No. 775,413
Int. Cl. H01r 33/08
U.S. Cl. 339—50 7 Claims

The present invention relates to a self-adjusting lampholder which is adapted for use with a U-shaped fluorescent lamp having spaced legs and a bipin base at the end of each leg. Such a lampholder comprises a socket body adapted to receive a pair of lamp pins therein and a mounting member which permits both angular and lateral movement of the lamp engaging portions of the lampholder relative to a fixture panel or other support. The mounting member also includes means for engaging with and detachably securing the lampholder to a fixed panel or the like. A pair of such lampholders are employed to receive and



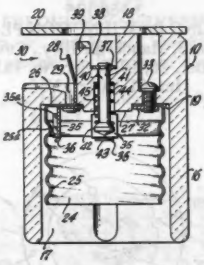
make electrical connections with pairs of lamp pins extending from bases at the spaced ends of the two legs of the lamp.

3,568,133

LAMP-POSITIONING MOGUL SOCKET

George E. Johnson, Bronxville, N.Y., assignor to Leviton Manufacturing Co., Inc, Brooklyn, N.Y.

Filed Sept. 9, 1968, Ser. No. 758,198
Int. Cl. H01r 13/62
U.S. Cl. 339—64 12 Claims



An electric lamp socket for an electric lamp having a screw type mogul base. Said socket having internal threads engaging with threads on the lamp base and having a spring-biased center contact with a pointed end of a hard material positioned to engage and make electrical contact with the center contact carried by the lamp base. Said socket including a plurality of lamp positioning members projecting upwardly from the bottom of the interior of the socket at points spaced outwardly relative to the center contact thereof. Said lamp positioning members being spaced angularly relative to each other and engaging with the base of the lamp at spaced points adjacent the outer circumference thereof when the center contact of the lamp is brought into engagement with the center contact of the socket.

The lamp positioning members being in the form of upwardly extending spring fingers formed from a resilient material, such as spring steel and being capable of being cammed outwardly by engagement with the lamp base.

3,568,134

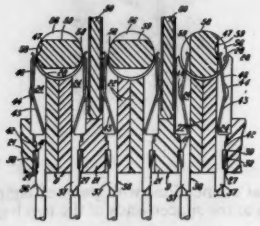
PACKAGING AND ACTUATING SYSTEM FOR PRINTED CIRCUIT BOARDS AND ELECTRICAL CONNECTOR ASSEMBLIES

John W. Anhalt, La Crescenta, and John V. Lane, Granada Hills, Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Original application Aug. 3, 1967, Ser. No. 658,258. Divided and this application Mar. 3, 1969, Ser. No. 816,865
Int. Cl. H01r 13/54
U.S. Cl. 339—75 2 Claims

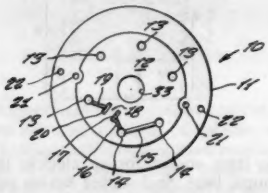
Printed circuit boards and electrical connectors provide convenient means of assembling circuits in electronic equipment. A packaging system is provided in which printed circuit boards or plug-type electrical connectors may be in-

serted into a system with zero insertion force. After the printed circuit boards or electrical connectors are supported in a rack, cam-actuated electrical contacts supported on the rack are actuated to make electrical contact with associated contact terminals on the printed circuit board or electrical connector plug. The packaging system includes cam support



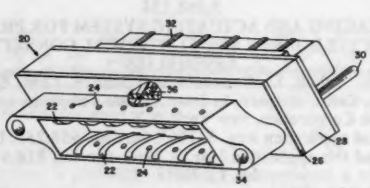
bars forming journals for cam shafts which actuate the electrical contacts, and contact carrier members releasably support electrical contacts in operative relation to the cam shafts. A rack and pinion mechanism interconnects individual cam shafts to effect simultaneous displacement of the electrical contacts to engage the associated printed circuit boards or electrical plug connectors.

3,568,135
CEILING BOX JUNCTION PLATE
Hardie Rogers, Rte. 3, Mandeville Hwy., Covington, La.
Filed Dec. 16, 1968, Ser. No. 783,973
Int. Cl. H01r *13/60*
U.S. Cl. 339—123 **1 Claim**



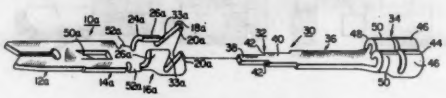
A ceiling box junction plate for making up the wiring in ceiling or light junction boxes, the device comprising an assembly including a plurality of connector openings, a pair of the connector openings being enjoined by a connection for extra wire capacity for ground wires, a connection to a standard female outlet receptacle, and a connection for hot lines from a wall switch to actuate a light.

3,568,136
ELECTRICAL CONNECTOR
Irving G. Wells, 311 Belvidere Road S.E., Huntsville, Ala.
Filed Jan. 27, 1969, Ser. No. 793,938
Int. Cl. H01r *13/50*
U.S. Cl. 339—156 **1 Claim**



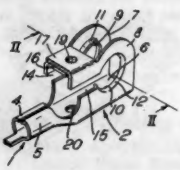
An electrical connector having holes predeterminately located therein whereby a test probe may be inserted to make contact with a particular contact of the connector.

3,568,137
ADAPTER FOR CONTACT WITH CRIMP TAIL
Maurice E. Youngblut, 301 W. Wellens Ave., Philadelphia, Pa.; James R. Hardman, Apt. 4C. Helen J. Apartments 1535 Township Line Road, Willow Grove, Pa.; Alexander Wontorsky, 5226 N. Sydenham St., Philadelphia, Pa., and William Lightkep, 1276 Dahlia Road, Warminster, Pa.
Filed Feb. 24, 1969, Ser. No. 801,672
Int. Cl. H01r *15/12*
U.S. Cl. 339—223 **6 Claims**



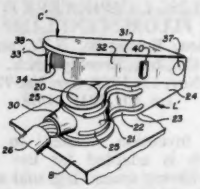
An adapter for use with an electrical contact has a forward portion adapted to be crimped to a crimp tail section of the contact. The rearward portion of the adapter is comprised of grasping means in the form of crimp tabs which are adapted to be crimped about the conductor of a lead of larger size than said crimp tail section can accommodate to mechanically and electrically connect the conductor to the adapter and hence said contact.

3,568,138
POST TERMINAL CONNECTOR
Roel Bakker, Langen, Germany, assignor to AMP Incorporated, Harrisburg, Pa.
Filed Jan. 2, 1969, Ser. No. 789,093
Claims priority, application Germany, Jan. 5, 1968, 1,640,002
Int. Cl. H01r *11/26*
U.S. Cl. 339—230 **8 Claims**



A battery terminal is made by stamping from sheet metal and bending to form two aligned holes which fit over a battery terminal post. Each hole is open on one side and has a lug bent from it through which a clamping screw can pass into the base of the terminal. A conductor can be crimped onto an integral ferrule.

3,568,139
BATTERY CABLE CONNECTOR
Jacob J. Delzer, 3212 Fruitvale Blvd., Yakima, Wash. 98902
Filed Nov. 12, 1968, Ser. No. 774,686
Int. Cl. H01r *7/06*
U.S. Cl. 339—239 **10 Claims**



A connector for the terminal post of a storage battery, in which a U-shaped clamp having a generally circular center is adapted to embrace the post and to be secured in position by

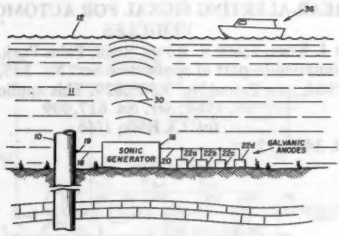
squeezing the center of the clamp upon the post. A channel-shaped cover is secured to the clamp by a pivot connecting the cover at the free ends of the clamp legs in a manner which permits the cover to be swung over and onto the clamp. This cover includes inward wedging abutments which squeeze the ends of the clamp together when the cover is swung into position upon the clamp, to lock the center of the clamp upon a battery post, but to thereafter release the clamp from the battery post when the cover is lifted away from the clamp.

3,568,140

UNDERWATER ELECTRICAL POWER SOURCE AND SONIC BEACON

Wallace B. Allen, and Floyd E. Blount, Dallas, Tex., assignors to Mobil Oil Corporation

Filed June 20, 1969, Ser. No. 835,022
Int. Cl. H04b *11/00*; H01m *17/100*
U.S. Cl. 340—4 **20 Claims**



The specification discloses an underwater sonic beacon for marking the location of metallic structures such as underwater wellheads. The sonic beacon is powered by a galvanic cell formed by the water as the electrolyte, the metallic structure as one electrode, and a galvanic anode spaced from the metallic structure as the other electrode. An electronic oscillator circuit and electroacoustic transducer are connected as the load on the galvanic cell. The sonic beacon is provided extended lifetime by sequentially activated anodes which produce continuous electrical power.

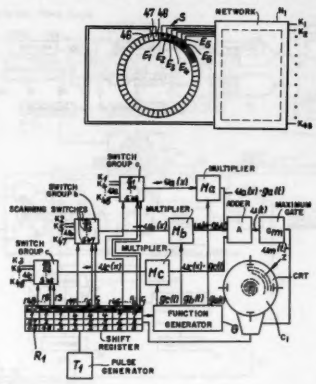
3,568,141

ACOUSTIC METHOD AND APPARATUS

Werner Schwarz, Bremen-Oberneuland; Reinhard Wilhelm Leisterer; Herwig Meyerhoff, Bremen, and Gunter Berkelmann, Achim, Germany, assignors to Fried, Krupp, Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Aug. 5, 1968, Ser. No. 784,962
Claims priority, application Germany, Aug. 3, 1967, 1,566,847
Int. Cl. G01s *3/00*, *9/66*
U.S. Cl. 340—6 **7 Claims**

Method and apparatus for scanning a plurality of channels to determine the azimuth of propagation of, and/or the Doppler shift in, acoustic waves which impinge on a receiver, where each channel carries a signal which is a different function of the azimuth or frequency, respectively, but where three or more of the signals are nonzero for the same value of azimuth or frequency. The method includes the steps of scanning the channels to obtain the nonzero signals in successive order, without interpolating to determine the azimuth



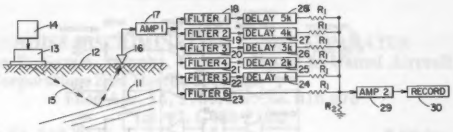
or frequency, and then interpolating the azimuth or frequency from the nonzero signals.

3,568,142

MULTIPLE FREQUENCY SURVEYING SYSTEM

Ralph A. Landrum, Jr., and John L. Shanks, Tulsa, Okla., assignors to Pan American Petroleum Corporation, Tulsa, Okla.

Filed Jan. 16, 1967, Ser. No. 609,527
Int. Cl. G01v *1/28*
U.S. Cl. 340—15.5 **7 Claims**



A seismic surveying method utilizes a vibratory source emitting a succession of differing frequency sine waves. Received waves after suitable amplification are passed through a group of narrow filters which separate the various frequency components. After suitable time delays, these components are recombined to present a record similar to that obtained from an explosive single source.

3,568,143

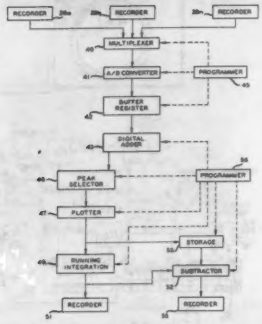
DETERMINATION OF TIME DISPLACEMENT BETWEEN COMMON INFORMATION IN SEISMIC SIGNALS

Paul J. Naquin, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company

Continuation of application Ser. No. 237,830, Nov. 15, 1962, now abandoned. This application Oct. 17, 1969, Ser. No. 871,518
Int. Cl. G01v *1/28*
U.S. Cl. 340—15.5 **7 Claims**

Automatic data processing apparatus is utilized to facilitate interpretation of seismic field data obtained from a field setup having a plurality of seismometer stations and a plurality of shot points. Vibrations are imparted to the earth at a first shot point and the reflected seismic signals are measured at a plurality of seismometer stations. The signals from adjacent pairs of seismometer stations are cross correlated to form a cross correlation signal. The procedure is repeated with the same pairs of seismometer stations for other shot point locations. The cross correlation signals for a given pair of seismometer stations are summed to form a composite cross correlation signal. The time difference value for each

pair of seismometer stations is then plotted against the location of the pair to form a time difference curve, which can then be subjected to running integration to obtain a dip curve

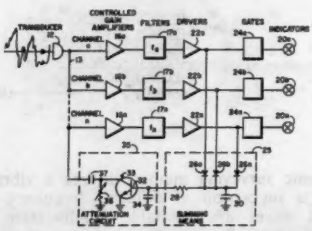


indicative of the dip of the subsurface formations. The subtraction of the dip curve from the time difference curve produces a time correction curve, which is indicative of the time corrections to be applied to the original data.

3,568,144
SOUND VIEWER APPARATUS

Maria L. M. Streb, Rochester, N.Y., assignor to Dewar Products Corp., Rochester, N.Y.

Filed Mar. 14, 1968, Ser. No. 713,027
Int. Cl. G08g *1/09*
U.S. Cl. 340—34 8 Claims



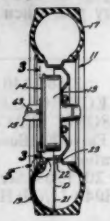
A sound viewer apparatus is described, including means for receiving an audio signal and converting it into an electrical signal, at least one amplifier for adjusting the intensity level of the electrical signal; a plurality of filters, each having a bandpass corresponding to the major frequency components of the audio signal produced by a particular device (viz a car engine, train whistle, horn or emergency vehicle siren); indicator means, such as lamps, connected to the output of the filters; and automatic gain control means responsive to the output of each filter for adjusting the electrical signal input to the amplifier for maintaining the input to the indicators at a level whereby the indicator means (lamps) can clearly show, by relative brightness, which type of device produced the audio sound and its relative intensity.

3,568,145
TIRE-WARNING APPARATUS

Joseph K. Dikoff, 15004 Oxnard St., Van Nuys, Calif., and J. Homer Harold Overholser, 4961 Palomar Drive, Tarzana, Calif. 91356

Filed Jan. 19, 1968, Ser. No. 699,164
Int. Cl. B60c *23/00*
U.S. Cl. 340—58 5 Claims

A tire-warning apparatus including a sensor disposed in a tire and connected in electrical circuit with a power source and an indicator. The sensor includes an elongated conductor having one end in connection with the power source and the opposite end, in one embodiment, adapted for contact with the tire rim when the tire becomes partially deflated to complete the electrical circuit through the indicator and indicate the condition of the tire. In another embodiment the

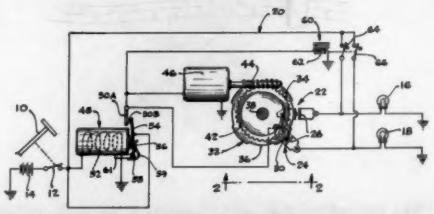


opposite end of the conductor is an electrical contact with the rim and its intermediate portion is disposed a predetermined distance beneath the peripheral surface of the tire whereby it will be worn through to break the electrical circuit when the tire becomes worn.

3,568,146
REAR-ALERTING SIGNAL FOR AUTOMOTIVE VEHICLES

August J. Knez, 12600 S. Roma Road, Palos Park, Ill. 60464

Continuation-in-part of application Ser. No. 355,855, Mar. 30, 1964, now Patent No. 3,305,829. This application Feb. 20, 1967, Ser. No. 617,409
Int. Cl. B60q *1/46*
U.S. Cl. 340—72 7 Claims



A rear-alerting signal for an automotive vehicle is described in which actuation of a speed control such as the brake of the vehicle causes immediate flashing of two lamps at the rear of the vehicle. The two lamps are connected in separate electrical circuits with separate switches and a source of power, and both of the switches are controlled by a cam to alternately close the switches. The cam is driven by an electrical motor connected in a series circuit controlled by a switch mechanically coupled to the speed control of the vehicle, and this series circuit includes a normally closed delay switch for deactuating the cam after the lapse of a period of time. Actuation of the time delay switch causes continuous illumination of both lamps until the speed control is deactuated.

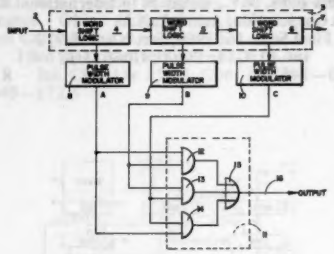
3,568,147
TRANSIENT FILTER SYSTEM

Paul R. Gilson, Santa Ana, Calif., assignor to North American Rockwell Corporation

Filed Mar. 4, 1969, Ser. No. 804,187
Int. Cl. G08c *25/00*
U.S. Cl. 340—146.1 4 Claims

Data samples transmitted from one location to another are separated in time and serially compared to determine transmission errors. Several sequential data samples are compared and the intermediate value of the monotonic order is selected

as representing the true value. Transient errors which would cause a data sample to be in error are then automatically



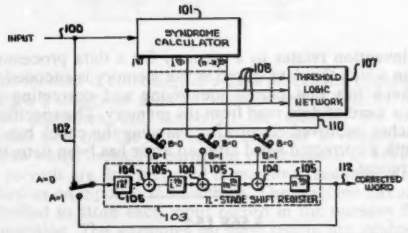
eliminated and the data sample having the value nearest the data sample caused to be in error is inserted in its place.

3,568,148

DECODER FOR ERROR CORRECTING CODES

George C. Clark, Jr., Indialantic, Fla., assignor to Radiation Incorporated, Melbourne, Fla.

Filed Apr. 2, 1969, Ser. No. 812,743
Int. Cl. G06f *11/12;* **G08c** *25/00*
U.S. Cl. 340—146.1 **10 Claims**



A decoder for error correcting binary cyclic group codes consisting of code words to be transmitted in blocks of n bits including k information bits and $n-k$ check bits, includes a syndrome calculator for computing the matrix product of each received word, which may have a maximum of t correctable transmission errors, with a modified form of the original parity check matrix defined by the check digits in the original code. The parity check matrix used in the computation is effectively modified by the syndrome calculator by development within the calculator of a syndrome or pattern of parity check failures corresponding to that which would be produced by multiplication of the received word with the desired modified parity check matrix. This operation spreads out the columns of the identity matrix into which the original parity check matrix is partitionable, from their original locations in consecutive columns in the original parity check matrix to spaced columns in the modified matrix, to permit examination of a larger set of error patterns than can ordinarily be contained in the syndrome. Decoding may then proceed in a conventional manner.

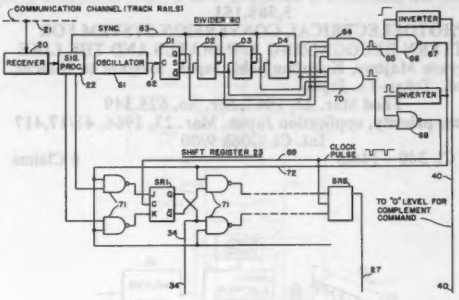
3,568,149

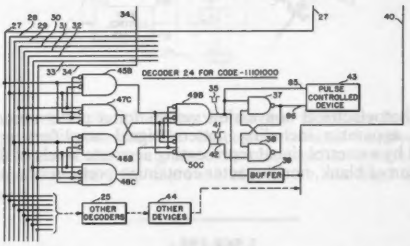
DIGITAL CODE RECEIVING SYSTEM

Henry C. Sibley, Adams Basin, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed Oct. 15, 1968, Ser. No. 767,766
Int. Cl. H03k *13/34;* **HO41** *1/10;* **H04q** *3/02*
U.S. Cl. 340—146.1 **9 Claims**

A digital code receiving system is provided wherein received bits of a digital code are applied as serial inputs to a shift register, and parallel readout of the shift register is applied to a plurality of decoders, each decoder being adapted to recognize only a single code distinctive of that decoder. For code checking purposes, only codes having the same numbers of mark and space characters are used. Each decoder has first and second outputs delivered successively, the first output checks the proper elements of the code. This output then complements the shift register at an intermediate point in the bit period, and the same decoder delivers a





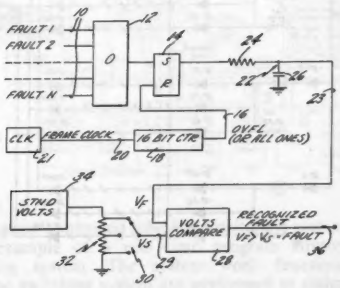
second output if the register is fully complemented. A control device is rendered operable in response to the alternate first and second outputs of its associated decoder.

3,568,150

NOISE DISCRIMINATING FAULT APPARATUS

John E. Games, Granby, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Apr. 16, 1969, Ser. No. 816,676
Int. Cl. G08b *23/00*
U.S. Cl. 340—146.1 **8 Claims**



Errors sensed in a data handling system are OR'ed into a latch in a data handling system which handles some number of data words (say 200) serially, a scan of all of the words comprising a frame, errors and faults which may occur at any time, in any word, in any frame, may set a fault latch. However, once set, the fault latch is reset only at the end of every 16 frames. The output of the fault latch is signal-averaged, or integrated, in an RC integrating network having a time constant of between ten and twenty times the period of the sixteen frames of words comprising a fault period. By comparing the average output voltage over a long period of time with a standard voltage, indicative of the average voltage equivalent of an error-indicating duty cycle of the fault latch

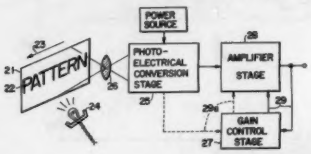
(in contrast with spurious setting as a result of noise signals), an indication of noise-discriminating fault is achieved.

3,568,151

PHOTOELECTRICAL CONVERSION SYSTEM FOR PATTERN-RECOGNIZING APPARATUS AND THE LIKE

Hideyasu Majima, Kokubunji-shi, Japan, assignor to Hitachi, Ltd., Tokyo-To, Japan

Filed Mar. 23, 1967, Ser. No. 625,349
Claims priority, application Japan, Mar. 23, 1966, 41/17,417
Int. Cl. G06k *9/00*
U.S. Cl. 340—146.3 **6 Claims**



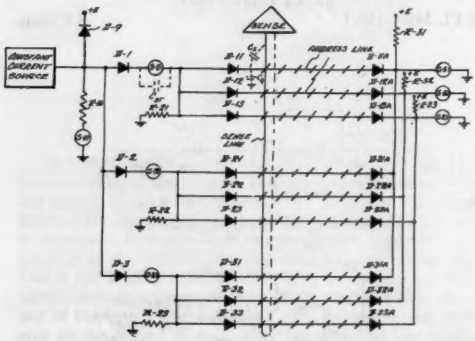
A photoelectrical conversion system for a pattern-recognizing apparatus including pattern signal amplifiers controlled by a control signal representing accurate levels of illumination of blank, noncharacter containing portions of a pattern.

3,568,152

METHOD AND APPARATUS FOR PRECONDITIONING A MEMORY SYSTEM

Gale A. Jallen, Roseville, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Nov. 8, 1967, Ser. No. 681,508
Int. Cl. G11c *7/00, 11/06*
U.S. Cl. 340—174 **5 Claims**



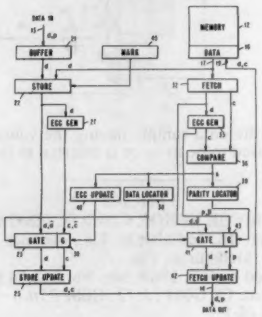
Arrangement for preconditioning a memory system having selectable address lines to reduce adverse effects arising during addressing caused by the effective shunt capacitance of the memory. The effective shunt impedance of the memory system is increased by a switching arrangement which permits the stray capacitances of the system to be charged prior to completion of a current path through a selected address line. When such a current path is subsequently completed, the switching arrangement bypasses enough current from this path to prevent the memory from being actuated. However, during this period the effective shunt capacitance associated with the selected path discharges. Thus, when the bypass is subsequently interrupted, full current passes through the selected address line without encountering adverse effects caused by shunt capacitance.

3,568,153

MEMORY WITH ERROR CORRECTION

Gerald W. Kurtz, Saugerties, and August K. Pattin, Jr., Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 16, 1968, Ser. No. 759,972
Int. Cl. G11c *29/00;* **G06f** *11/12*
U.S. Cl. 340—146.1 **8 Claims**



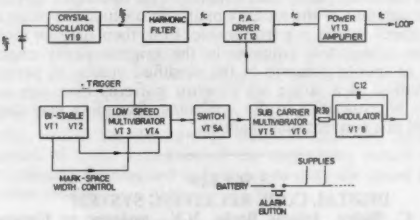
This invention relates to a memory for a data processing system in which the data stored in the memory is encoded to form check bits that permit identifying and correcting an error in a word of data read from the memory. The specification teaches improved circuits for changing the check bits to agree with a corrected word after an error has been detected and corrected.

3,568,154

SECURITY ALARM TRANSMISSION OF RADIO FREQUENCY CODED PULSES

Edward C. Sills, Cranfield; Brian R. Moffitt, Bedford, and David W. McQue, Bletchley, England, assignors to Securiton A.G., Zollikofen, Switzerland

Filed June 30, 1967, Ser. No. 650,446
Claims priority, application Great Britain, July 4, 1966, 29982/66
Int. Cl. H04q *7/00*
U.S. Cl. 340—167 **5 Claims**

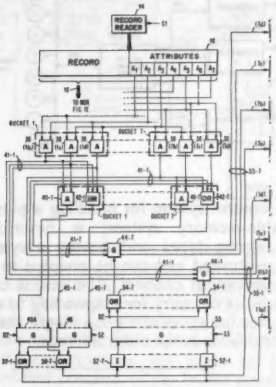


A security alarm system wherein an alarm signal is sent by a transmitter which generates a radiofrequency carrier wave modulated by an audiofrequency signal which is further pulse code modulated. A receiver is provided which includes a tuned RF stage for selecting the transmitted signal, a detector and an audiofrequency filter for recovering the pulse modulated audiofrequency signal, and a pulse code demodulator for decoding the receiver pulses and supplying an actuating pulse to an alarm device.

3,568,155
METHOD OF STORING AND RETRIEVING RECORDS

Chacko T. Abraham, Yorktown Heights; Sakti P. Ghosh, Peekskill, N.Y., and Dwijendra K. Ray-Chaudhuri, Worthington, Ohio, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 10, 1967, Ser. No. 629,485
Int. Cl. G11c *15/00*; G06f *15/40*
U.S. Cl. 340—172.5 **9 Claims**



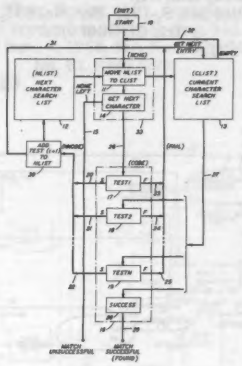
The method is embodied in a data processing apparatus in which a plurality of records, each having a number of different attributes, are stored in the memory file of the machine and the file is then interrogated to retrieve those records which include a particular combination of attributes. The records are first prepared in machine readable form and applied as an input to the machine. The machine circuitry is controlled to store each input record in the memory file of the machine. The attributes for each record are analyzed in predetermined combinations of two or more attributes, and the address for each stored record is stored in one or more buckets in the memory file according to the combination(s) of attributes in each record. After the records are stored, the file is interrogated by applying input queries which specify certain combinations of attributes. From each input query, the machine circuitry is controlled to locate the bucket in which the addresses of all records which satisfy the query are stored. These addresses are then read out and used to retrieve the records themselves from the record file. In order to minimize the redundancy of storage of the addresses of the records, the addresses are grouped in buckets in the memory file in predetermined unique combinations of $k+1$ (e.g. 4) attributes, where k (e.g. 3) is the number of attributes in the queries for which the system is principally designed. In each such bucket the record addresses are arranged in $k+2$ (e.g. 5) subbuckets. The addresses for all records including all of the $k+1$ (e.g. 4) attributes are stored in one subbucket and the remaining addresses in that bucket are stored in the remaining $k+1$ (e.g. 4) subbuckets according to which of the combinations of k (e.g. 3) only of the $k+1$ (e.g. 4) attributes are present in the record identified by this particular address.

3,568,156
TEXT MATCHING ALGORITHM

Kenneth L. Thompson, Chatham Township, Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 9, 1967, Ser. No. 659,389
Int. Cl. G06f *7/34*
U.S. Cl. 340—172.5 **8 Claims**

A general purpose computer program and special purpose apparatus for matching strings of alphanumeric characters are disclosed. The algorithm involved makes use of a current-character search list (augmented for all alternative characters) and a next-character search list (augmented for all successful character matches). These characters are portions of the test text to which the string to be matched is compared. Each character of the string to be matched is tested by the current character list, during which time the next character list is compiled. Then a new character is obtained, the next

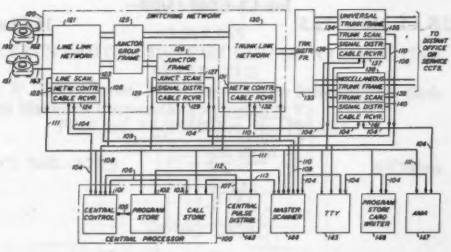


character list substituted for the current character list, and the process continues. The process terminates successfully when test text characters are exhausted, and terminates unsuccessfully when the searched text to be matched is exhausted.

3,568,157
PROGRAM CONTROLLED DATA PROCESSING SYSTEM

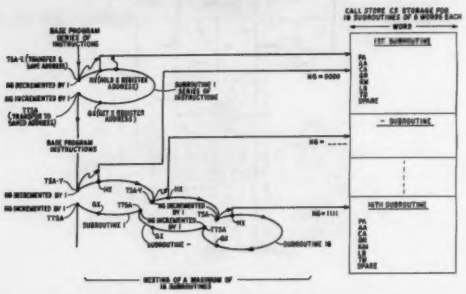
Randall W. Downing, Wheaton, Ill.; Michael P. Fabisch, Bronx, N.Y.; John A. Harr, Geneva; John S. Nowak, Wheaton; Frank F. Taylor, West Chicago, and Werner Ulrich, Glen Ellyn, Ill., assignors to Bell Telephone Laboratories Incorporated, New York, N.Y.

Original application Dec. 31, 1963, Ser. No. 334,875. Divided and this application Nov. 24, 1967, Ser. No. 685,642
Int. Cl. G06f *9/18*
U.S. Cl. 340—172.5 **31 Claims**



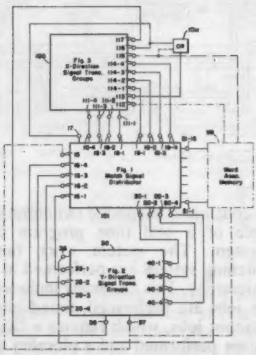
A program controlled telephone switching system is shown as an example of a real time program controlled data processing system. The system work functions of the telephone switching system are performed at assigned levels of a priority hierarchy. This hierarchy includes a base level at which routine jobs are performed, timed interrupt levels at which input-output jobs, which require a fair degree of timing precision, are performed and a plurality of trouble interrupt levels (maintenance interrupt levels), which are employed to initiate remedial actions in accordance with a prescribed remedial plan. The telephone functions which are performed at the base level are allocated processor time in accordance with a base level executive program frequency table. The base level executive program provides time for execution of certain low priority maintenance functions. In the absence of trouble the processor time is shared by the timed interrupt level programs and the base level programs. The trouble interrupt programs are initiated upon the detection of corresponding classes of trouble.

3,568,158
PROGRAM AND SUBROUTINE DATA STORAGE AND RETRIEVAL EQUIPMENT
Neil M. Haller, West Chicago, and Frank S. Vigilante, Naperville, Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Jan. 3, 1968, Ser. No. 695,397
Int. Cl. G06f 9/00
U.S. Cl. 340—172.5 20 Claims



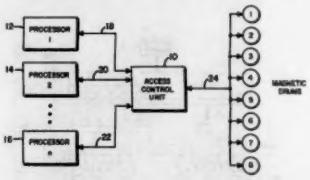
An electronic program controlled telephone system is disclosed having a call processor for controlling the establishment of call connections among lines, trunks and service circuits via a switching network. The call processor comprises a program control which receives program instructions from a program store to control the establishment of call connections. A call store is included in the processor for storing call data under control of the program control and an input-output control circuit.

3,568,159
MULTIMATCH PROCESSING SYSTEM
Ryo Igarashi, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan
Filed Feb. 2, 1968, Ser. No. 702,686
Claims priority, application Japan, Feb. 9, 1967, 448499
Int. Cl. G06f 15/00
U.S. Cl. 340—172.5 16 Claims



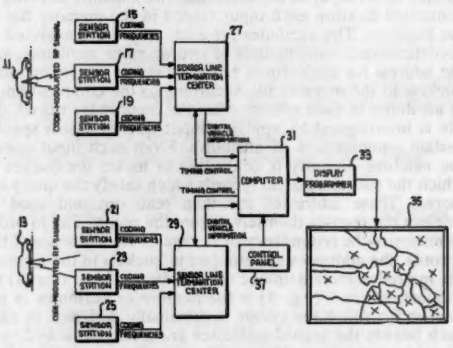
A multimatch system for processing the results of the matching of memory signals, including an *m*-number of flip-flop circuits disposed in an *X*-direction and an *n*-number of flip-flop circuits positioned in a *Y*-direction to indicate such matches thereby enabling the system to process an *m x n* number of memory words. The system also contains corresponding *m* and *n* numbers of each of AND and OR gates arranged in the *X* and *Y* directions for use with the respective *m* and *n* numbers of *X* and *Y* direction flip-flop circuits.

3,568,160
ACCESS CONTROL FOR PLURAL MAGNETIC MEMORIES
Anthony R. Talarczyk, Bloomington, Minn., assignor to Sperry Rand Corporation, New York, N.Y.
Filed Sept. 3, 1968, Ser. No. 756,830
Int. Cl. G06f 13/00
U.S. Cl. 340—172.5 8 Claims



An access control system for handling a plurality of types of addressable-memory systems is described. Memory devices of varying types and having varying addressing systems are controlled and can be coupled to a single data processor input/output channel. The access control system described includes circuitry for responding to selected fields of control words for establishing the length and bit positions of other control fields in the control words.

3,568,161
VEHICLE LOCATOR SYSTEM
Elwyn Raymond Knickel, 2560 36th St. NW., Washington, D.C.
Filed Sept. 4, 1968, Ser. No. 757,410
Int. Cl. G06f 15/20
U.S. Cl. 340—172.5 35 Claims

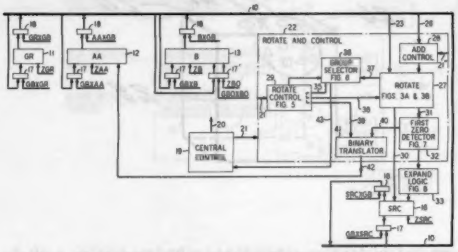


A system for automatically locating vehicles within a prescribed area utilizes an emitter comprising a coded transmitter device carried by each vehicle, a plurality of sensor stations disposed at preselected locations within the prescribed area for receiving vehicle identification-coded signals from nearby vehicles, a vehicle identification decoder for processing of coded signals received by the sensor stations, and a digital computer for processing decoded information to locate each vehicle on the basis of which sensor station most recently received that vehicle's coded signal. The system may be utilized for police car location, whereby existing police call boxes may be utilized as sensor stations, and wherein a display map is provided on which lamps are lighted to indicate the presence of a police car sufficiently close to a call box to have its signal received thereby. Apart from the identification code, additional coded information may be emitted indicating vehicle status (i.e., fully loaded bus, for example, in a bus locator system) or emergency situations.

3,568,162
DATA PROCESSING WITH DUAL FUNCTION LOGIC

Wing N. Toy, Glen Ellyn, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 27, 1968, Ser. No. 763,198
Int. Cl. G06f *5/00*
U.S. Cl. 340—172.5 13 Claims

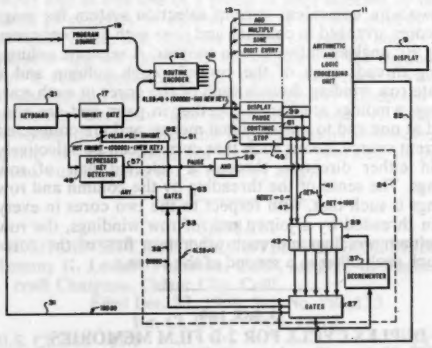


The contents of a selected one of plural general purpose registers in a data processing system are selectably coupled through first-ZERO-detecting logic to modify the contents of a buffer register. The modification takes the form of setting to the ONE state the bit position in the buffer register corresponding to the low order ZERO position of the originating register contents and resetting any lower bit positions to ZERO. The modified contents of the buffer register are then coupled back to the one originating register. Program-controlled circuits perform, in selectable sequences, the normal store and reset types of operations on the originating registers in the course of the movement of information to the ZERO detecting logic and back again. Illustrative processing functions that can be selected in this fashion include marking a low order ZERO and incrementing the contents of the originating register. Another first-ZERO-detecting logic circuit is employed to control the operation of a rotate circuit in cooperation with the first-mentioned ZERO detecting logic to permit both ZERO detectors to have a data bit width which is much smaller than the processor word size.

3,568,163
INCREMENTAL DISPLAY CIRCUIT

Thomas E. Osborne, San Francisco, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 7, 1968, Ser. No. 765,422
Int. Cl. G06f *3/14*
U.S. Cl. 340—172.5 5 Claims

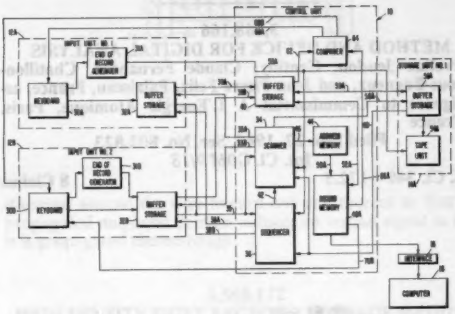


A display circuit for a calculating machine may be activated at selected intervals in a series of preselected program steps to provide a momentary output indication of an incremental calculation. Resumption of operation according to the preselected program steps may be inhibited manually to extend the duration of the output indication.

3,568,164
COMPUTER INPUT SYSTEM

Robert Schiller, Silver Spring, Md., assignor to Computer Entry Systems Corporation, Silver Spring, Md.

Filed Nov. 4, 1968, Ser. No. 772,934
Int. Cl. G06f *9/18*
U.S. Cl. 340—172.5 5 Claims

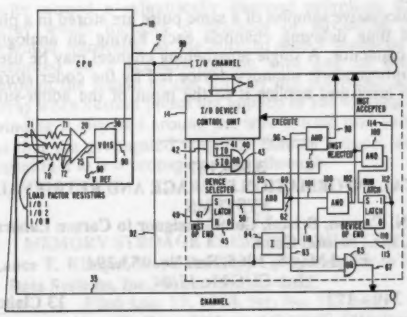


A computer input system. Data from a plurality of input units is transmitted through a single time-shared control unit to a like plurality of tape storage units. The control unit sequentially scans the several input units, and, when an input unit has a data character ready for storage, the control unit transfers the character to a buffer storage unit within the control unit. After a complete data record is in the buffer storage, it is transferred to the associated tape storage unit, and another data record is then applied from the input unit to buffer storage. After all data records are in the tape storage, they can be transferred through the same control unit to a utilizing computer without manual handling of the tape. The time-shared control unit cycles at a rate which permits continuous operation by all input units.

3,568,165
OVERRUN PROTECTION CIRCUIT FOR A COMPUTING APPARATUS

John W. Kerr, Byron, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 14, 1969, Ser. No. 791,007
Int. Cl. G05b *19/38*
U.S. Cl. 340—172.5 6 Claims



An overrun protection circuit for a computing apparatus having a plurality of I/O devices with predetermined load-

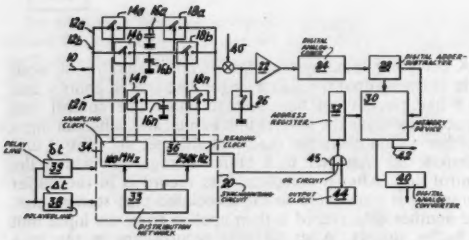
operating characteristics operated in an overlap mode of operation. The overrun protection circuit includes a logic circuit at each I/O device and a test circuit at the CPU which provides a summation of load operating characteristics of all I/O devices operating in the computing apparatus at a predetermined instant and a comparison of such sum with a signal indicative of the maximum load-operating characteristic for the computer. The comparison signal determines whether the particular I/O device may be added to those operating in the computing apparatus at that instant and initiates operation in the logic circuit to accept or reject the operation request from the CPU.

3,568,166

METHOD AND DEVICE FOR DIGITAL ANALYSIS

Herveline Jeudon, Gentilly; Claude Fernandes, Chatillon-sous-Bagneux, and Jean-Pierre Felix, Palaiseau, France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed Feb. 27, 1969, Ser. No. 802,823
Int. Cl. G06f 9/18
U.S. Cl. 340—172.5 **8 Claims**



A recurrent signal consisting of pulses which can be identified in time is analyzed in order to extract the signal from the background noise; samples of a first pulse are taken at instants which are separated by predetermined time intervals Y, and digitalized, the result is written in an addressable digital memory channel by a digital adder-subtracter, a zero level determined by sampling by the same sampling circuit at a selected instant is subtracted from the contents of each channel of the digital memory and the same sequence is carried on a large number of pulses which come later than the first pulse the samples being added in the digital memory channels.

The successive samples of a same pulse are stored in a plurality of time delaying channels each having an analogue storage capacitor. A single lengthening channel may be used and an intermediate memory device fed by the coder stores the zero level and applies it to the input of the adder-subtracter.

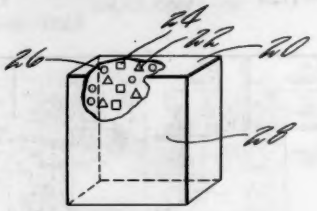
3,568,167

OPTICAL INFORMATION STORAGE AND RETRIEVAL SYSTEMS

Arthur N. Carson, Bristol, Conn., assignor to Carson Laboratories, Inc., Bristol, Conn.

Filed May 5, 1965, Ser. No. 453,294
Int. Cl. G11c 13/04
U.S. Cl. 340—173 **13 Claims**

An optical information storage and retrieval system is presented employing hydrogenated color center crystals as the storage medium. A composite of such crystals, whether hydrogenated or not, may be employed for multicolor storage. Also, an erasing system is disclosed in which erasing light is delivered to a storage crystal in leading relationship with respect to signal light, and erasing light is delivered to



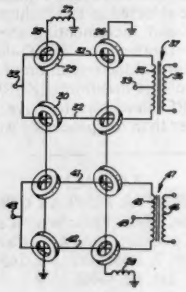
the crystal in lagging relationship with respect to readout light.

3,568,168

MEMORY APPARATUS

William J. Neuman, Burnsville, Minn., assignor to Fabri-Tek Incorporated, Edina, Minn.

Filed May 25, 1966, Ser. No. 552,742
Int. Cl. G11c 7/00, 11/06, 5/02
U.S. Cl. 340—174 **21 Claims**



A two-wire coincident current selection system for magnetic cores arranged in columns and rows with adjacent cores having 90° angles relative to one another. A separate column winding threads each of the cores in each column and a separate row winding threads each of the cores in each row. The row windings are joined together in pairs and are connected at one end to output signal means, and are connected to current source means such that current can be selectively sent in either direction through a selected pair of row windings. The sense of the threading by the column and row windings is such that, with respect to the two cores in every column threaded by a joined pair of row windings, the row and column windings aid each other in a first of the cores and buck each other in a second of the cores.

3,568,169

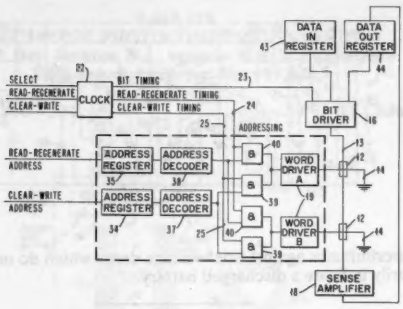
DUPLEX CYCLE FOR 2-D FILM MEMORIES

Victor T. Shahan, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed July 11, 1967, Ser. No. 652,496
Int. Cl. G11c 7/00, 11/14
U.S. Cl. 340—174 **6 Claims**

Magnetic memory having timing means to perform simultaneous operations on two words of the memory. In one em-

bodiment the sequence is read A, clear B, write B, regenerate A. In a second embodiment the sequence is clear B, read A, write B, regenerate A.

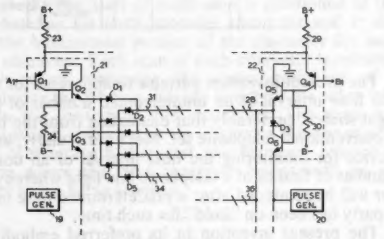


3,568,170

CORE MEMORY DRIVE SYSTEM

Louis Catalani, Jr., Hawthorne, and Thomas J. Gilligan, Palos Verdes, Calif., assignors to Electronic Memories, Incorporated, Hawthorne, Calif.

Filed May 21, 1968, Ser. No. 730,821
Int. Cl. G11c *7/00, 11/06*
U.S. Cl. 340—174 **16 Claims**



A core memory drive system with direct coupling to a decoder is provided by: a first bank of sink-drive switches, one switch for each of *M* decoder output signals selecting a group of *N* lines; and a second bank of sink-drive switches, one switch for each of *N* decoder output signals selecting the other end of one line of a group of lines selected by the first bank of switches. A current pulse is applied directly to the switches of the first bank for a store operation, and a current pulse is applied directly to the switches of the second bank for a read operation. Each switch comprises a switching transistor and two other transistors directly connected to the switching transistor and a group of lines. At least one blocking diode isolates the two transistors connected to a group of lines. Additional diodes are provided to prevent sneak current paths in the memory array.

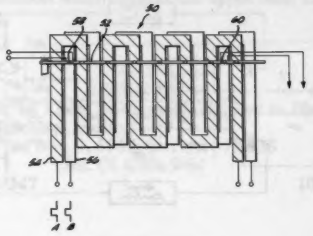
3,568,171

HIGH DENSITY SHIFT REGISTER STORAGE MEDIUM

Tommy G. Lesher, Fullerton, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 23, 1968, Ser. No. 786,123
Int. Cl. G11c *19/00, 11/12*
U.S. Cl. 340—174 **9 Claims**

A magnetic shift register including a fine drawn wire magnetic recording medium of cobalt, iron and vanadium which is annealed, the wire being wound under tension in a helix around a cylindrically disposed polyphase advancing array which includes a plurality of advancing windings oriented transverse to the wire so that a magnetic domain recorded on a segment of the wire can be propagated through the length of the wire by the polyphase advancing array when current pulses are applied to the windings. A read winding is disposed around the wire toward one end thereof so that the propagated magnetic domain induces an output signal in it as it is propagated therethrough.

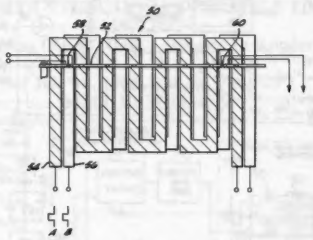


3,568,172

HIGH DENSITY SHIFT REGISTER STORAGE MEDIUM

Tommy G. Lesher, Fullerton, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 23, 1968, Ser. No. 785,917
Int. Cl. G11c *19/00, 11/12*
U.S. Cl. 340—174 **9 Claims**



A magnetic shift register including a fine drawn wire magnetic recording medium of cobalt, iron and vanadium which can be annealed, the wire being wound under tension in a helix around a cylindrically disposed polyphase advancing array which includes a plurality of advancing windings oriented transverse to the wire so that a magnetic domain recorded on a segment of the wire can be propagated through the length of the wire by the polyphase advancing array when current pulses are applied to the windings. A read winding is disposed around the wire toward one end thereof so that the propagated magnetic domain induces an output signal in it as it is propagated therethrough.

3,568,173

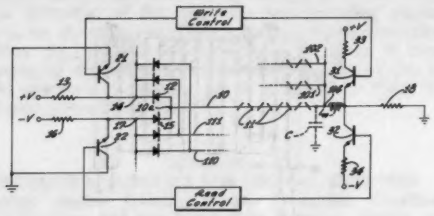
MEMORY STROAGE ELEMENT DRIVE CIRCUIT

Lance T. Klinger, Playa Del Rey, Calif., assignor to Scientific Data Systems, Inc., Santa Monica, Calif.

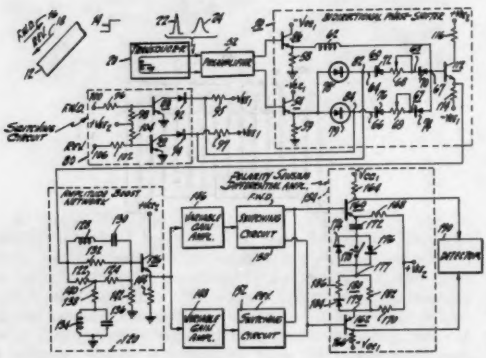
Filed Aug. 19, 1968, Ser. No. 753,541
Int. Cl. G11c *7/00, 11/06;* **H03k** *17/66*
U.S. Cl. 340—174 **10 Claims**

A memory core wire drive circuit is disclosed in which one wire end is normally biased to ground but controlled through

a pair of transistors each connecting through series resistors to sources of opposite potentials. The other wire end connects through reversely biased diodes and two transistors directly to ground.



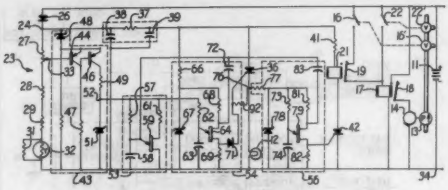
3,568,174
COMPENSATED READBACK CIRCUIT
George V. Jacoby, Bala-Cynwyd, Pa., and Joseph D. Gleitman, Camden, N.J., assignors to RCA Corporation
Filed Mar. 15, 1968, Ser. No. 713,459
Int. Cl. G11b *5/44, 5/00*
U.S. Cl. 340—174.1 **10 Claims**



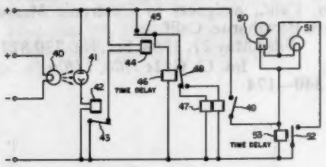
In high performance data recording and readback systems, both forward direction and reverse direction reading of the storage medium occurs. The readback signals derived from reading in either direction are phase compensated to make the self-timing clock signal extracted therefrom more accurate.

3,568,175
PROTECTIVE MONITORING CIRCUIT FOR A VEHICLE BATTERY
Richard A. Schwehr, South Euclid, and Marc A. Pohm, Lorain, Ohio, assignors to Towmotor Corporation, Cleveland, Ohio
Filed Mar. 14, 1968, Ser. No. 713,113
Int. Cl. G08b *21/00;* **H02j** *7/00.*
U.S. Cl. 340—249 **2 Claims**

A solid-state circuit provides a visual indication when the battery of an industrial truck is approaching a discharged condition and if the condition is not corrected within a predetermined time the circuit automatically inactivates one or more electrical components thereby protecting the battery and forcing the operator to take remedial action. The circuit discriminates against brief voltage drops which do not necessarily indicate a discharged battery.



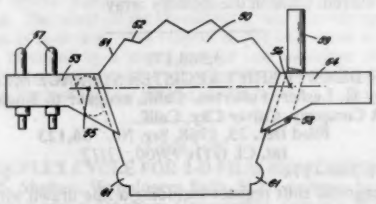
3,568,176
SIGNAL MONITORING APPARATUS
Carroll W. Schouest, New Orleans, La.
Filed Jan. 6, 1968, Ser. No. 701,030
Int. Cl. G08b *21/00*
U.S. Cl. 340—251 **2 Claims**



The present invention pertains to apparatus for monitoring the time interval of an uninterrupted number of pulses of a light source, preferably that emanating from the line light of a conventional telephone set. More particularly, an electrical device for monitoring the time interval of an uninterrupted number of flashes of a telephone line light whereby an operator will be reminded after a predetermined time interval that a party has been on "hold" for such time.

The present invention in its preferred embodiment basically comprises photocell means in combination with a series of contacts and relays whereby the time interval of a number of uninterrupted number of flashes of a telephone line light are monitored.

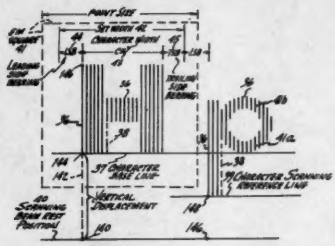
3,568,177
MULTICOLOR INDICATORS
Edmond F. Hasler, Ashstead, Surrey, England, assignor to Central Electricity Generating Board, London, England
Filed Aug. 31, 1967, Ser. No. 664,727
Claims priority, application Great Britain, Sept. 2, 1966, 39234/66
Int. Cl. F21v *7/04*
U.S. Cl. 340—324 **6 Claims**



A multicolor indicator system has two or more lamps with differently colored filter and a housing with a plurality of reflecting facets such that light is reflected out through a

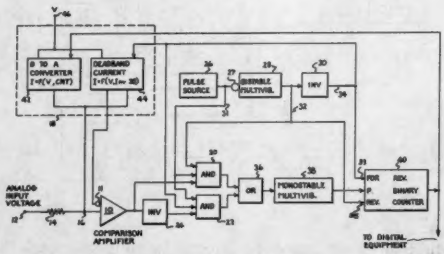
viewing aperture from each lamp over the whole of a required range of viewing angles.

3,568,178
ELECTRONIC PHOTOCOMPOSITION SYSTEM
Robert F. Day, Trenton, N.J., assignor to RCA Corporation
Filed Dec. 8, 1967, Ser. No. 689,044
Int. Cl. G06f *3/14*
U.S. Cl. 340—324 **11 Claims**



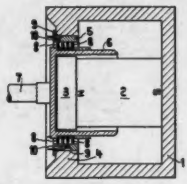
An electronic photocomposition system forms patterns, including characters, on an imaging device, such as a cathode ray tube, and focuses the patterns onto a photosensitive surface for recording thereon. The characters formed include ascender characters that ascend from a predetermined character baseline and descender characters that descend below the character baseline. Each character is formed by a plurality of successive vertical scans that create individual character slices. The start of each scan is positioned at the character baseline for each ascender character and is displaced to the bottommost portion of the character for each descender character. Each scan of each character is retraced immediately upon traversing the outer periphery of a character during the scan so that the length of the scans corresponds to the contour of the characters. The scans are stepped across the character as the character is scanned and, at the end of scanning a character, the scans are jumped to the position where the next character begins with no intercharacter space being scanned.

3,568,179
ANALOG-TO-DIGITAL CONVERTER
John O. Lampkin, Jr., Roanoke, Va., assignor to General Electric Company
Filed Sept. 20, 1967, Ser. No. 669,179
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 **3 Claims**



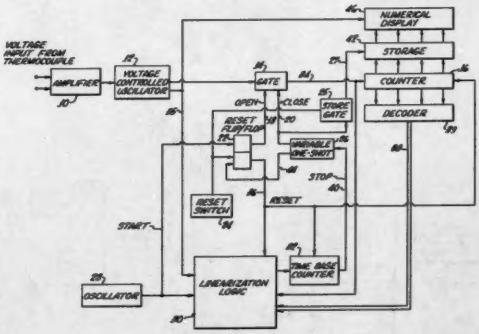
A continuously tracking analog to digital converter including a switching comparison amplifier, a pulse source, a reversible binary counter, and a gating circuit which allows pulses to be applied to the counter only under certain conditions of current imbalance at the amplifier. A negative analog signal is balanced at the amplifier by a positive D to A converter current and by a deadband current, the polarity of which is changed by the pulse source. The D to A current magnitude is a function of the counter contents and of the supply voltage for the D to A converter. The deadband current is a function of the supply voltage and of the state of a bistable multivibrator connected to the pulse source. When only slight current imbalance exists at the amplifier, the amplifier is continuously switched by the changing deadband current, a condition which inhibits the application of pulses to the counter.

3,568,180
ENCODER
Eduard Rosch, Le Locle, Switzerland, assignor to Dixi S. A., Le Locle, Neuchatel, Switzerland
Filed Nov. 1, 1967, Ser. No. 679,838
Int. Cl. G08c *9/04*
U.S. Cl. 340—347 **10 Claims**



An encoder having a number of output circuits including each a resistor of which the resistance value depends on the magnetic field intensity in it, the field intensity being controlled by a code track associated with each resistor.

3,568,181
SYSTEM FOR LINEARIZING A NONLINEAR CONTINUOUS FUNCTION BY VARIABLE TIME SAMPLING
John H. Weaver, Encino, Calif., assignor to Anadex Instruments, Inc.
Filed July 12, 1968, Ser. No. 744,529
Int. Cl. H03k *13/00*
U.S. Cl. 340—347 **5 Claims**



A voltage representing a point on a nonlinear continuous curve having a known characteristic shape is converted to a periodic function having a frequency determined by the magnitude of the input voltage. A gating means is enabled by a variable time base generating means and applies the periodic function to a counting means for a sample time determined by the frequency of the periodic function, the accumulated count in the counting means, and the characteristic shape of the voltage curve. When the gating means is disabled at the end of the sample time, the counting means contains a value representing the magnitude of the input voltage.

3,568,182

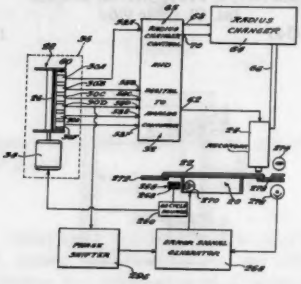
METHOD FOR PRODUCING CODE MEMBERS

Edward M. Jones, Cincinnati, Ohio, assignor to D. H. Baldwin Company, Cincinnati, Ohio

Original application June 18, 1962, Ser. No. 203,354, now Patent No. 3,235,878. Divided and this application Dec. 13, 1965, Ser. No. 513,478

Int. Cl. H03k *13/04*

U.S. Cl. 340—347 6 Claims



A method for recording an image on a photosensitive surface rotating on a turntable in which the area of the image is varied responsive to the numerical value of a digitally recorded tape transported in synchronism with the rotation of the turntable.

3,568,183

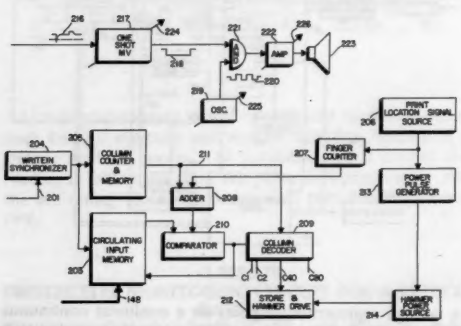
KEYBOARD SYNCHRONIZED TONED GENERATOR

Jacob K. Snell; John J. Larew, and Clifford M. Jones, Waynesboro, Va., assignors to General Electric Company

Filed July 9, 1968, Ser. No. 743,470

Int. Cl. H04l *15/12*

U.S. Cl. 340—365 18 Claims



In a keyboard printer arrangement utilizing the multibit, binary coded digital signals representative of the printable symbols associated with an operated key to generate separate sounds synchronized with key operation and audibly distinguishable from nonsynchronized or changing printing sounds.

3,568,184

DIRECTIONAL ANTENNA ARRAY HAVING IMPROVED ELECTRONIC DIRECTIONAL CONTROL

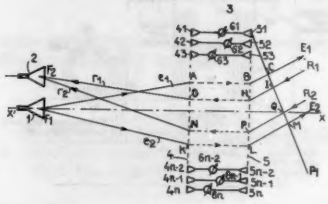
Serge V. Drabowitch, Chatenay Malabry, France, assignor to Compagnie Francaise Thomson Houston - Hotchkiss Brandt, Paris, France

Filed Sept. 30, 1966, Ser. No. 583,309

Claims priority, application France, Oct. 14, 1965, Nov. 2, 1965, 34931;36937

Int. Cl. G01s *9/02;* H01q *19/06, 3/26*

U.S. Cl. 343—5 10 Claims



A plurality of transmitting and/or receiving radiators made operational in a predetermined sequence, confront a focusing assembly which includes an array of controllable phase shifters for converting planar waves into spherical waves or vice versa, the phase shifts introduced by this array being periodically altered under the control of a timer to center the spherical wave fronts on one side of the array successively upon the several radiators whenever the latter are made operational.

3,568,185

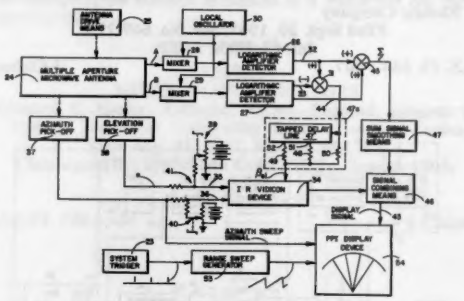
MAPPING SIGNAL DISPLAY APPARATUS

Jerome M. Page, Fullerton, Calif., assignor to North American Rockwell Corporation

Filed Mar. 30, 1964, Ser. No. 356,357

Int. Cl. G01s *9/00*

U.S. Cl. 343—6 10 Claims

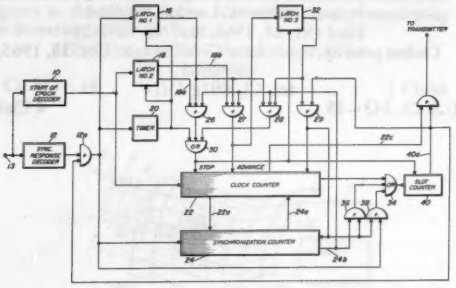


Multiple-sensor means for detecting a multiple-energy target comprising pulsed energy monopulse scanning means for providing signals indicative of the range and direction of a detected target; passive radiant energy means in cooperation with said monopulse means for providing signals indicative of radiant energy radiated from said direction other than said pulsed energy; and signal combining means responsive to said pulsed energy means and said passive sensor means for providing a display signal indicating the presence of a target which both reflects said pulsed energy and radiates said radiated energy.

3,568,186
EXTENDED RANGE CLOCK SYNCHRONIZATION FOR COLLISION AVOIDANCE SYSTEM

Wayne G. Shear, Pompano Beach, Fla.; Merlin E. Olmstead, Baltimore, Md., and Samuel Roger Everett, Ft. Lauderdale, Fla., assignors to The Bendix Corporation, Fort Lauderdale, Fla.

Filed Dec. 3, 1968, Ser. No. 780,729
Int. Cl. G01s 9/56
U.S. Cl. 343—6.5 11 Claims

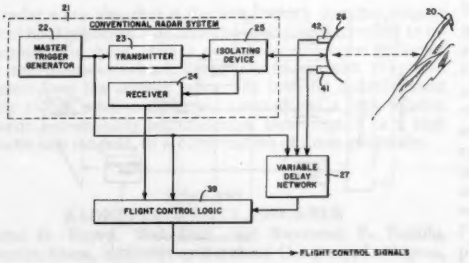


Apparatus for synchronizing clocks within a cooperative collision avoidance network wherein an aircraft after operating in an isolated environment for a predetermined time sets its clock in a standby position and listens for start of epoch signals. Upon hearing a start of epoch signal the aircraft immediately starts its clock and begins counting epochs and the time slots contained therein. During own time slot, as determined by its clock, the aircraft transmits a clock synchronization request. If no synchronization responses are received the aircraft will automatically advance its clock by a predetermined amount and once again transmit a synchronization request during its next time slot. If a synchronization response is now received the aircraft will synchronize its clock taking into account the amount of time by which its clock had to be advanced in order to receive the synchronization response. If no response is received the aircraft automatically returns its clock to the standby condition.

3,568,187
TERRAIN AVOIDANCE RADAR SYSTEM

Bartow Bechtel, Mountain View, Calif.; Grady D. Satterwhite, and James H. Sharp, Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 29, 1961, Ser. No. 163,358
Int. Cl. G01s 9/02
U.S. Cl. 343—7 12 Claims

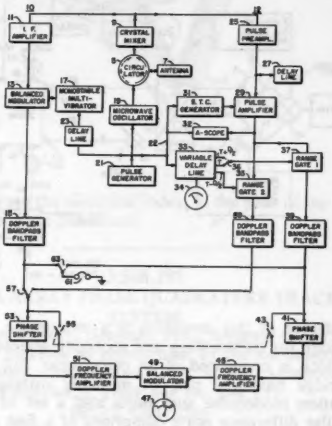


The present invention relates to radar systems and more particularly relates to a terrain avoidance system for monitoring and detecting terrain and other obstacles in the path of an airborne vehicle and automatically programming the flight of the vehicle to avoid the detected obstacles.

3,568,188
CONTINUOUS WAVE RADAR WITH MEANS FOR INDICATING MOVING TARGET DIRECTION

William Fishbein, Elberon, and Otto E. Rittenbach, Neptune, N.J., assignors to the United States of America, as represented by the Secretary of the Army

Filed Mar. 7, 1967, Ser. No. 624,650
Int. Cl. G01s 9/42
U.S. Cl. 343—7.7 6 Claims

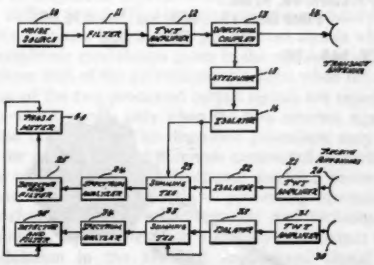


A continuous wave radar set in which the transmitted wave is periodically gradually reversed in phase by frequency modulating the microwave oscillator thereof. The target echoes are heterodyned with a sample of the transmitted wave and applied in parallel to an all-range channel and a ranging channel. Doppler frequency signals from all moving targets within the radar beam appear in the all-range channel, whereas in the ranging channel Doppler frequency signals at any range can be selected by means of range gates. By correlating Doppler signals from the two channels, or a pair of signals from the ranging channel, target range and directivity information may be obtained.

3,568,189
SPECTRUM ANALYSIS RADAR SYSTEM FOR ANGLE DETERMINATION

Joseph L. Poirier, 26 Brian Road, Chelmsford, Mass.

Filed Mar. 11, 1969, Ser. No. 806,227
Int. Cl. G01s 9/02
U.S. Cl. 343—16 9 Claims



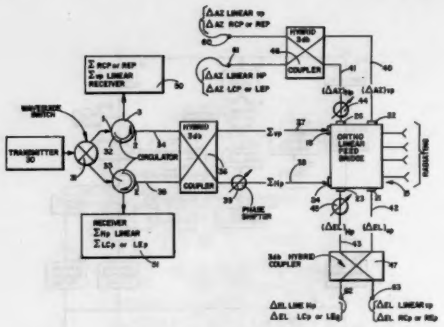
Spectrum analysis radar system in which the location of modulation nulls depends upon the exact electrical range to a target so that with two antennas separated by a known distance, the small difference in range to a target causes the null location to shift relative to each other to provide the angle of arrival of the reflected target.

3,568,190

FULL MONOPULSE VARIABLE POLARIZATION FEED BRIDGE

Sam H. Wong, Yorba Linda, Calif., assignor to North American Rockwell Corporation

Filed July 26, 1968, Ser. No. 748,066
Int. Cl. G01s 9/22
U.S. Cl. 343—16 8 Claims



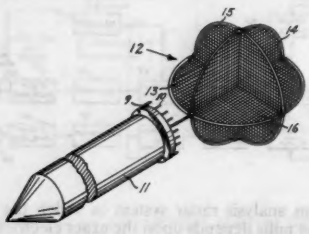
The device of this invention is a monopulse microwave feed bridge for transmitting and receiving selected polarizations which is comprised of an ortholinear, full monopulse feed bridge having a pair of mutually orthogonal linear polarization monopulse sum ports and a set of dual-plane monopulse difference ports comprised of a first and second pair of mutually orthogonal linear polarization receiver ports. The phase at one port of each of the three pairs of ports is adjustable and a 3db hybrid coupler is interposed at each pair of ports. A waveguide switch cooperates with the summation channel 3db hybrid coupler and the variable phase shifter to selectively control and vary the polarization of the transmitted waves. The 3db hybrid couplers at the monopulse difference channel outputs and the adjustable monopulse difference channel phase shifters provide difference channel receiver responses to selected polarizations in a multimode system application. This particular configuration allows the selection of any particular type of transmitted polarized wave while simultaneously providing the capacity to selectively receive the transmitted polarization and its orthogonal polarizations. In a second embodiment of the invention, the 3db hybrid couplers are replaced by 3db hybrid switches to provide a linear polarization mode on transmit and receive.

3,568,191

METHOD FOR DEFENDING AN AIRCRAFT AGAINST A FRONTAL ATTACK

James C. Hiester, Baltimore, Md., and Harry L. Van Trees, Jr., Watertown, Mass.

Filed Dec. 15, 1960, Ser. No. 076,082
Int. Cl. H01q 15/20
U.S. Cl. 343—18 1 Claim



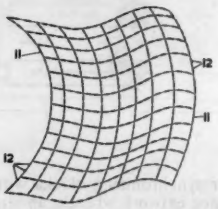
A method for defending an aircraft against a frontal attack by an interceptor comprising, launching a rocket in the direction of travel of said aircraft, said rocket containing in a collapsed condition a collapsible reflector having three orthogonal surfaces of wire mesh, then ejecting said reflector from said rocket whereupon said reflector is expanded, and then towing said reflector whereby said reflector serves as a target for attracting said interceptor.

3,568,192

ARTIFICIAL SATELLITES

Thomas William Grant Dawson, Washington, D.C., assignor to Minister of Technology in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, Millbank, London, England

Filed Oct. 24, 1966, Ser. No. 589,129
Claims priority, application Great Britain, Oct. 28, 1965, 45765/65
Int. Cl. H01g 15/14
U.S. Cl. 343—18 4 Claims



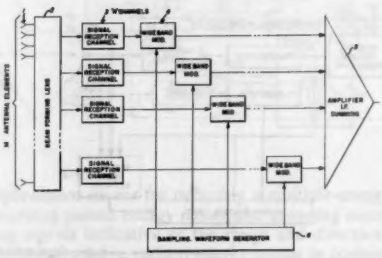
A very light, easily dispensed, efficient and durable passive radial communication satellite comprising a filamentary net-like structure of which alternate lengths of the filaments are metal coated to comprise dipoles, and in which those surfaces of the net filaments between the metal covered dipole regions are covered with a layer of metal which affords protection against damage to the net by long-wavelength ultraviolet radiation and reduces the rate of evaporation of the net material, said layer of metal being of small thickness compared to that forming the dipoles so that radio wave reflection therefrom is negligible.

3,568,193

ANGLE DISCRIMINATION RADAR RECEIVING SYSTEM HAVING SUBSTANTIAL SIDE LOBE CANCELLATION

David K. Barton, Lexington, and Eric W. Beasley, Framingham, Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Nov. 29, 1967, Ser. No. 686,678
Int. Cl. G01s 9/02
U.S. Cl. 343—16 10 Claims



The receiving system comprises an antenna array of *m* elements spaced at discrete points for obtaining Shannon samples over an arc of an incident signal phase front, the arc center being taken at the antenna array. The phase front signals from the *m* elements are distributed onto *n* reception

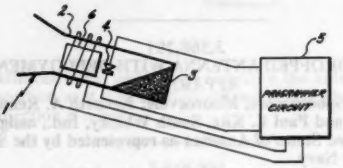
channels, n being less than m. Each phase front signal present in a given rank ordering of reception channels is multiplied by a sampling signal. This multiplication results in a time domain weighted analog of the received signal space of the phase front along the arc. A summing network extracts the angle of incidence information from the time domain weighted analog signal.

3,568,194

SYSTEM FOR DEGRADING RADAR RETURN SIGNALS

Robert G. Wilson, Riverside, Calif.; Gordon L. Burton, Acton, Mass., and Edward N. Skomal, Redlands, Calif., assignors to the United States of America as represented by the Secretary of the Air Force

Filed Oct. 11, 1967, Ser. No. 675,278
Int. Cl. G01s 7/42
U.S. Cl. 343—18 **1 Claim**



A method and system for degrading the performance of radars that track satellites, reentry vehicles and the like. The method and system comprises phase and/or amplitude modulation of the radar signal by one or more "scattering" sources positioned on the target vehicle, thus causing the return target signal to appear as an incoherent object. Scattering sources suitable for appropriate modulation include antenna reflectors connected to variable load transmission lines.

3,568,195

ELECTROMAGNETIC WAVE ATTENUATING DEVICE

Ludwig Wesch, Heidelberg, and Hans H. Meinke, Munich-Gauting, Germany

Filed Nov. 23, 1959, Ser. No. 854,979
Claims priority, application Germany, Dec. 4, 1958, E16 822VIIIa/21a4
Int. Cl. H01q 17/00
U.S. Cl. 343—18 **19 Claims**

A radar wave absorber is disclosed which does not require a metal backing layer. The absorber operates according to interference principles, with a portion of the wave reflected from the absorber's back layer interfering with the wave reflected from the surface layer. The backing material must exhibit a high relative dielectric constant, or a high relative magnetic permeability and dielectric loss tangent, or a high magnetic loss tangent, or a combination of these properties.

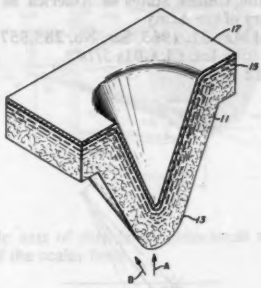
3,568,196

RADIO FREQUENCY ABSORBER

Richard O. Bayrd, Wakefield, and Raymond P. Tuinila, Beverly, Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Feb. 6, 1969, Ser. No. 797,042
Int. Cl. H01q 17/00
U.S. Cl. 343—18 **6 Claims**

An absorber for radio frequency energy using incombustible materials to minimize adverse effects from the conversion of such energy to heat, including a fibrous mat of nonabsorbing material in which the absorbing material is distributed in such a manner that discontinuities in the index of refraction,



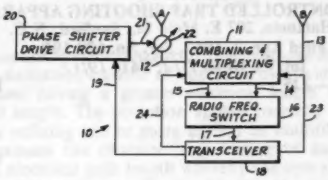
meaning always the electrical index, in the path of the energy to be absorbed are minimized.

3,568,197

ANTENNA ARRAY PHASE QUADRATURE TRACKING SYSTEM

Harold Dean Cubley, Houston, Tex., Assignor to the United States of America as represented by the administrator of the National Aeronautics and Space Administration.

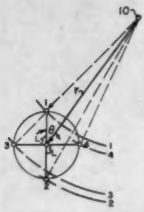
Filed Dec. 5, 1969, Ser. No. 882,577
Int. Cl. G01s 3/46
U.S. Cl. 343—100 **9 Claims**



The system input signals on two separate antenna elements in an antenna array are combined to form two processed signals with one such signal representing the absolute value of the sum of the two antenna signals and the other representing the absolute value of the difference of the signals. The two processed signals are time multiplexed through a radiofrequency switch operating at 10-millisecond intervals to form a single input signal to a receiver which in turn detects amplitude modulation in the multiplexed signal and forms an amplitude dependent signal to control a variable phase shifter circuit. The latter circuit automatically alters the relative phase between the two antenna signals whenever any amplitude modulation exists in the multiplex signal. Relative phase shift of the antenna signals stops when the absolute value of the two processed output signals are equal to each other which occurs only when the two antenna signals are in phase quadrature. The described procedure may be employed for any number of antennas connected in parallel to provide substantially omnidirectional antenna coverage and the time multiplexing and signal processing operations may be performed with stripline circuitry and techniques. For transmitting, a phase detector is employed to detect the phase modulation in the received multiplexed signal to establish and switch to the antenna in the array which will provide the greatest system gain for use while transmitting.

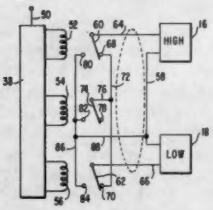
The invention described herein was made by an employee of the United States Government and may be manufactured and used by or for the government for governmental purposes without the payment of any royalties thereon or therefor.

3,568,198
CORRELATION CURVATURE RADAR
Sidney Borowitz, New York; Norman Caplan, Brooklyn; Gordon C. Dewey, and Milton Stoller, New York, N.Y., assignors to the United States of America as represented by the Secretary of the Army
Filed May 31, 1963, Ser. No. 285,557
Int. Cl. G01s *5/14*
U.S. Cl. 343—112 **11 Claims**



Short base line range measuring system having a plurality of receiving stations in a circle and a central station. Correlation techniques are used with pairs of stations connected sequentially through coarse and fine delay lines, and processing the signals to determine range.

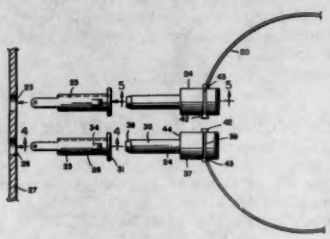
3,568,199
RADIO CONTROLLED TRAP SHOOTING APPARATUS
William R. Hartness, 207 E. Main St., Sanford, N.C. 27330
Filed Apr. 7, 1967, Ser. No. 629,195
Int. Cl. H04b *7/12*; **F41c** *19/12*
U.S. Cl. 343—225 **1 Claim**



A portable apparatus for remotely controlling the launching of disc targets. A multichannel radio transmitter is mounted on a scoring board and a fixed multichannel radio receiver, adapted to receive selected signals from the transmitter, is connected to target launching mechanisms to provide a trigger therefor. The desired launching mechanism is triggered by the choice of the transmitting channel over which a signal is sent.

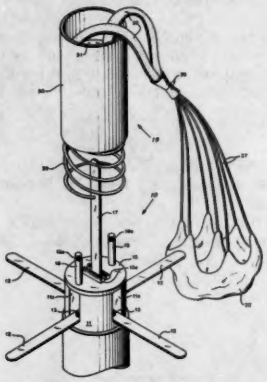
3,568,200
MOUNTING ASSEMBLY FOR LOOP ANTENNA
Peter G. Seyler, Franklin Park, Ill., assignor to Perfection Spring & Stamping Corporation, Mt. Prospect, Ill.
Filed Nov. 19, 1969, Ser. No. 877,986
Int. Cl. H01q *1/24*
U.S. Cl. 343—702 **14 Claims**

A mounting assembly for a loop-shaped television antenna includes a pair of pin members and a pair of socket members. Each pin member is provided with a slot for rotatably receiving an end of the antenna and includes an elongated portion



which is rotatably received by a tubular portion of the socket member.

3,568,201
AIR DROPPED ANTENNA WITH DEPLOYMENT APPARATUS
David W. Spoonamore, Monroeville; Kenneth A. Renno, Fort Wayne, and Paul E. Kite, South Whitley, Ind., assignors to the United States of America as represented by the Secretary of the Navy.
Filed Aug. 12, 1969, Ser. No. 849,421
Int. Cl. H01g *1/28*
U.S. Cl. 343—705 **10 Claims**

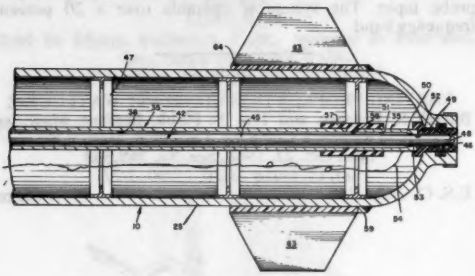


Antenna deployment apparatus for an air-launched electronic buoy having a self-erecting main antenna element and a plurality of self-erecting, radiating ground plane antenna elements which are retained during descent in undeployed, spirally wound conditions by a spring loaded housing assembly in turn maintained in deployment preventing position by a pivotally mounted latch which is pinned in interlocking engagement with a pair of locking posts. At some time after landing, a timer activates an explosive squib to force the latch to shear a pin and move to a releasing position causing assembly ejection which facilitates antenna deployment and parachute separation.

3,568,202
EXTENDIBLE ANTENNA FOR BATHYTHERMOGRAPH
John A. Fitton, Jr., Santa Monica; James W. Hoffer, Redondo Beach, and Clyde E. Williamson, Los Angeles, Calif., assignors to TRW Inc., Redondo Beach, Calif.
Filed Feb. 8, 1968, Ser. No. 703,971
Int. Cl. H01g *1/34*, *1/10*, *1/50*
U.S. Cl. 343—709 **11 Claims**

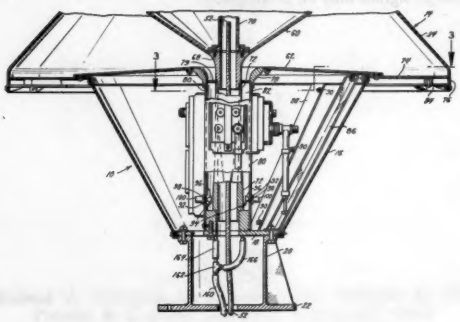
An extendible antenna for a bathythermograph and combination thereof, in which there are supporting means for the

antenna in a stowed position within the bathythermograph and in an extended position outwardly of the latter, including means to move the antenna to its extended position at a



predetermined time, and means to secure the antenna in the latter position as it is being fully extended and where electrical connection is made.

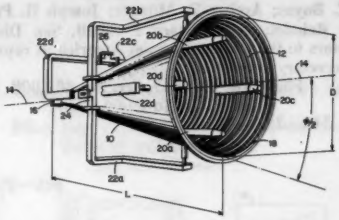
3,568,203
DIRECTION FINDING ANTENNA ASSEMBLY
Donald C. Venters, Nashua, N.H.; John W. Krah, and Belton H. Gardner, Florissant, Mo., assignors to McDonnell Douglas Corporation, St Louis County, Mo.
Filed Nov. 1, 1967, Ser. No. 679,680
Int. Cl. H01q *21/28*
U.S. Cl. 343—725 **10 Claims**



A direction finding antenna assembly including a horn antenna structure and associated microwave circuitry capable of operating to instantaneously and continuously determine the direction from which a signal is being received. The assembly may also include in the same structure a collinear antenna array.

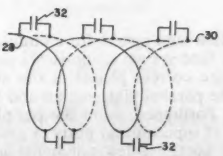
3,568,204
MULTIMODE ANTENNA FEED SYSTEM HAVING A PLURALITY OF TRACKING ELEMENTS MOUNTED SYMMETRICALLY ABOUT THE INNER WALLS AND AT THE APERTURE END OF A SCALAR HORN
Leonard L. Blaisdell, Medway, Mass., assignor to Sylvania Electric Products Inc.
Filed Apr. 29, 1969, Ser. No. 820,160
Int. Cl. H01g *21/00, 13/00, 1/36*
U.S. Cl. 343—725 **5 Claims**

An antenna feed system employing a plurality of tracking elements mounted symmetrically about the inner walls and at the aperture end of a scalar horn. The tracking elements



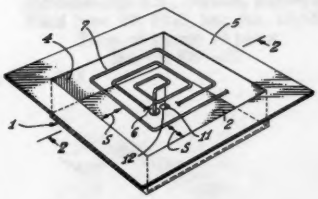
have a single axis of directivity coincident with the axis of directivity of the scalar horn.

3,568,205
NOVEL HELICAL ANTENNA
Albert C. Buxton, Akron, and Jerrold S. Foley, Stow, Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio
Filed Feb. 12, 1968, Ser. No. 704,671
Int. Cl. H01g *1/36, 9/00*
U.S. Cl. 343—749 **8 Claims**



A directional electromagnetic radiating antenna with circular polarization capable of operating over wide frequency bands and having a greater electrical length than actual physical length. The invention applies basically to a helical antenna utilizing one or more unifilar or multifilar windings which possess the characterizing feature of having an increased electrical path length whereby the operating characteristics of the antenna will resemble that of a larger physical structure than is actually necessary to support the hardware comprising the antenna.

3,568,206
TRANSMISSION LINE LOADED ANNULAR SLOT ANTENNA
Austin R. Sisson, Canoga Park; Dale W. Milligan, Chatsworth, and Robert D. Wanselow, Calabasas, Calif., assignors to Northrop Corporation, Beverly Hills, Calif.
Filed Feb. 15, 1968, Ser. No. 705,841
Int. Cl. H01q *9/26, 13/18, 1/36*
U.S. Cl. 343—750 **4 Claims**



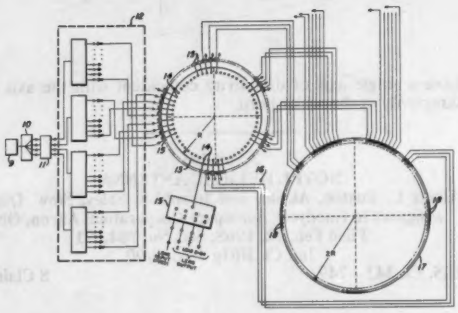
A probe is connected to the bottom of a cavity, and a spiraled conductor is connected to the top of the probe, where the outer turns of the spiral are spaced from the cavity top edges to form an electrically small slot. This antenna is fed from the cavity bottom near the probe by the extension of the center conductor of a terminated coaxial line.

3,568,207

PARALLEL-PLATE FEED SYSTEM FOR A CIRCULAR ARRAY ANTENNA

Jerry E. Boyns; Archer D. Munger; Joseph H. Provencher; John Reindel; and Bernard I. Small, San Diego, Calif., assignors to the United States of America as represented by the Secretary of the Navy

Filed Feb. 25, 1969, Ser. No. 802,008
Int. Cl. H01q 19/06, 3/26
U.S. Cl. 343—754 4 Claims



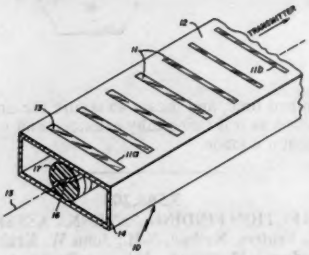
A parallel-plate feed system for a circular array antenna is disclosed. The feed system comprises a parallel-plate region which places the correct phases at the array radiating elements when the parallel-plate region and the array radii are in a 1:2 ratio. Positioned about the periphery of the region are a plurality of input-output ports or probes. A plurality of adjacent input ports are fed simultaneously with a tapered amplitude distribution. By feeding more than one of the input probes simultaneously, the energy propagated through the parallel-plate region is highly directive, and the amplitude distribution obtained at the output probes has a considerable taper. By applying the resulting amplitude distribution to a sector of the circular array with the proper phase from the region low sidelobe patterns can be obtained. The beam is scanned in azimuth by means of diode switches at each lens port and by additional circuitry to maintain the proper input-probe taper. The system is operable over a 20 percent frequency band.

3,568,208

VARYING PROPAGATION CONSTANT WAVEGUIDE

Burrell R. Hatcher, and Troy E. Plunk, Bedford, Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Oct. 22, 1968, Ser. No. 769,563
Int. Cl. H01q 13/10, 13/00, 3/21
U.S. Cl. 343—768 4 Claims

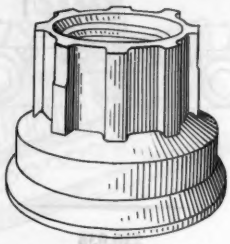


A phased array waveguide antenna system having a rotatable member with a plurality of discontinuities to adjust for the electrical parameters disposed along the longitudinal axis of the waveguide feed line. The rotatable member may be rotated continuously at varying rates of speed of, for example, one scan per second and pulsed as well as continuous energy signals may be propagated.

DESIGNS

MARCH 2, 1971

220,027
LOCKNUT
Paul D. Myers, Fullerton, Calif., assignor to Microdot, Inc., South Pasadena, Calif.
Filed June 23, 1969, Ser. No. 17,829
Term of patent 14 years
Int. Cl. D8—*04*
U.S. Cl. D8—273



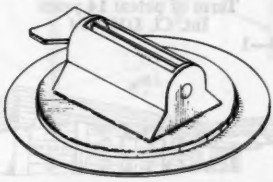
220,028
COMBINED BOTTLE AND STOPPER THEREFOR
Richard L. Weckman, Perrysburg, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Dec. 31, 1969, Ser. No. 20,727
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—113

220,029
BOTTLE
Roland E. Johnson, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Sept. 25, 1969, Ser. No. 19,296
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—116

220,030
BOTTLE
James E. Plummer, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Dec. 11, 1969, Ser. No. 20,464
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—160

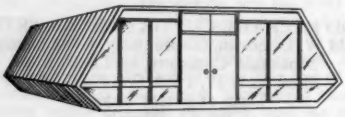
220,031
FOOD PACKAGE CUP OR SIMILAR ARTICLE
Donald W. Donovan, Glastonbury, Conn., assignor to Monsanto Company, St. Louis, Mo.
Filed Nov. 17, 1969, Ser. No. 20,134
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D9—220

220,032
MEASURED DOSE DISPENSING CLOSURE FOR A JAR OR THE LIKE
Emanuel Dee, Nassau, Bahamas, assignor to Dee's International S.A., Nassau, Bahamas
Filed Nov. 20, 1968, Ser. No. 14,551
Term of patent 14 years
Int. Cl. D9—*02*
U.S. Cl. D9—275



220,033
STORAGE CONTAINER FOR SMALL GRAINS OR THE LIKE
Leo M. Becker, 42 Janssen Place, Kansas City, Mo. 64109
Filed July 9, 1969, Ser. No. 18,118
Term of patent 14 years
Int. Cl. D25—*99*; D23—*01*
U.S. Cl. D13—1

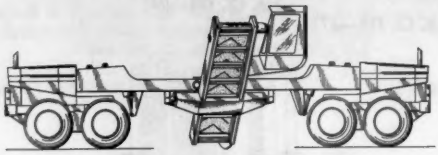
220,034
VACATION HOUSE
William S. Bowers, 22800 76th W., Edmonds, Wash. 98020
Filed Nov. 3, 1969, Ser. No. 19,919
Term of patent 14 years
Int. Cl. D25—*04*
U.S. Cl. D13—1



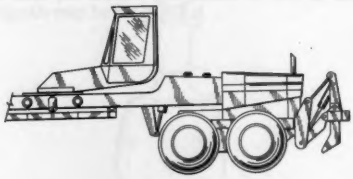
220,035
BUILDING
Kenneth D. Sauder, 1861 Brentwood Drive, Clearwater, Fla. 33516
Filed Nov. 24, 1969, Ser. No. 20,230
Term of patent 14 years
Int. Cl. D25—*04*
U.S. Cl. D13—1

220,036
BUILDING
Kenneth D. Sauder, 1861 Brentwood Drive, Clearwater, Fla. 33516
Filed Jan. 23, 1970, Ser. No. 21,044
Term of patent 14 years
Int. Cl. D25—*04*
U.S. Cl. D13—1

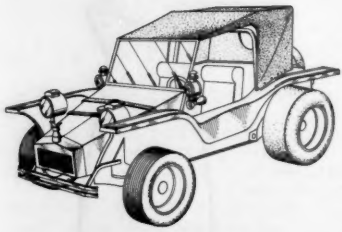
220,037
EXCAVATING MACHINE
George W. Swisher, Jr., Oklahoma City, Don W. Smith, Edmond, and Gordon L. Spivey, Oklahoma City, Okla., assignors to CMI Corp., Oklahoma City, Okla.
Filed Mar. 20, 1969, Ser. No. 16,338
Term of patent 14 years
Int. Cl. D12—*09*
U.S. Cl. D14—3



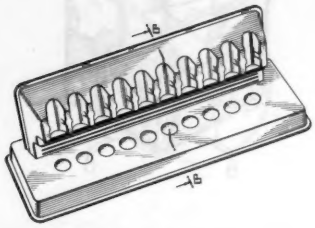
220,038
SCARIFIER MACHINE
George W. Swisher, Jr., Oklahoma City, Don W. Smith, Edmond, and Gordon L. Spivey, Oklahoma City, Okla., assignors to CMI Corp., Oklahoma City, Okla.
Filed Mar. 20, 1969, Ser. No. 16,346
Term of patent 14 years
Int. Cl. D12—*09*
U.S. Cl. D14—3

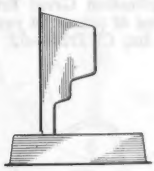


220,039
SPORT BUGGY
George Barris, Encino, Calif., assignor to Barris Buggies, Inc., Anaheim, Calif.
Filed Nov. 24, 1969, Ser. No. 20,255
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D14—3



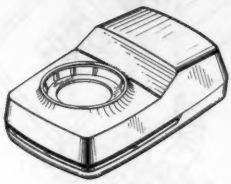
220,040
DIAGNOSTIC MULTIPLE TEST VIEWING RACK FOR TEST TUBES
Horace E. Carver, Jr., Frenchtown, N.J., assignor to Ortho Pharmaceutical Corporation
Filed July 17, 1969, Ser. No. 18,343
Term of patent 14 years
Int. Cl. D24—*02*; D6—*99*
U.S. Cl. D16—1

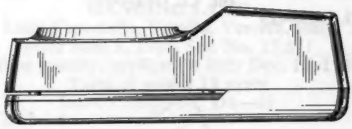




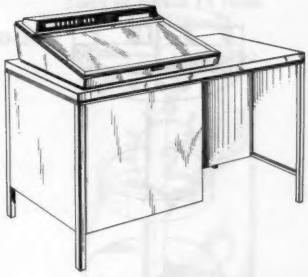
220,041
SYRINGE HEAD
Rodrick Koufnik, Vista, Calif., assignor to Coastal Dynamics Corporation
Filed Dec. 12, 1969, Ser. No. 20,649
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—1

220,042
HOUSING FOR A REMOTE CONTROL ELECTRONIC THERMOSTAT
Joseph A. Rinaldi, Fort Lee, N.J., assignor to Kimco Laboratories, Inc., Brooklyn, N.Y.
Filed Dec. 17, 1969, Ser. No. 20,548
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13





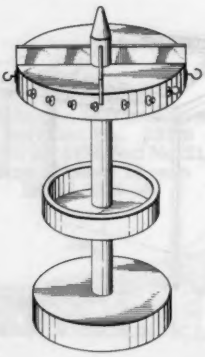
220,043
MAGNETIC TAPE CARTRIDGE DUPLICATOR
Leonard N. Albrecht, Tiburon, and James M. Zeiszler, Mill Valley, Calif., assignors to Cybercom Corporation, Sunnyvale, Calif.
Filed July 17, 1969, Ser. No. 18,249
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—14



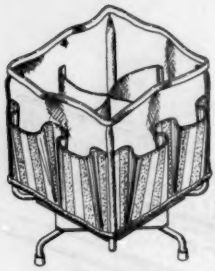
220,044
EMERGENCY TELEPHONE LIGHT
Fred G. Sinclair, 1330 NE. 144th St., North Miami, Fla. 33161
Filed Nov. 14, 1969, Ser. No. 20,078
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14

220,045
RELIGIOUS ORNAMENT OR THE LIKE
James J. Simon, 28180 Lorraine, Warren, Mich. 48092
Filed June 2, 1969, Ser. No. 17,480
Term of patent 14 years
Int. Cl. D11—*99*
U.S. Cl. D29—23

220,046
JEWELRY CADDY
Virgil Pascarella and Arlene Pascarella, both of 133 Laurel Ave., New Castle, Pa. 16101
Filed Oct. 22, 1969, Ser. No. 19,676
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D33—3

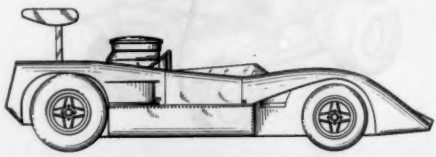


220,047
STORAGE CONTAINER FOR SHOES
David H. Fiel, 2318 Baylis Ave., Elmont, N.Y. 11003
Filed Nov. 12, 1969, Ser. No. 20,035
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D33—3

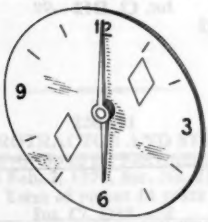


220,048
CASTELLATED SAND BUCKET
Peter William Reading, Stevenage, England, assignor to Tortoys Limited, London, England
Filed Nov. 6, 1969, Ser. No. 19,968
Claims priority, application Great Britain May 8, 1969
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—15

220,049
MODEL RACING CAR
Bruce Leslie McLaren, Weybridge, England, assignor to Bruce McLaren Motor Racing Limited, Colnbrook, Buckinghamshire, England
Filed Jan. 14, 1970, Ser. No. 20,922
Claims priority, application Great Britain July 26, 1969
Term of patent 7 years
Int. Cl. D21—*02*
U.S. Cl. D34—15

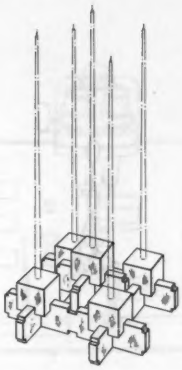


220,050
COMBINED DIAL AND HANDS FOR A WATCH OR SIMILAR ARTICLE
Louis A. Yannich, 36 Bonham Drive, Edison, N.J. 08817
Filed Sept. 30, 1969, Ser. No. 19,344
Term of patent 7 years
Int. Cl. D10—*06*
U.S. Cl. D42—1

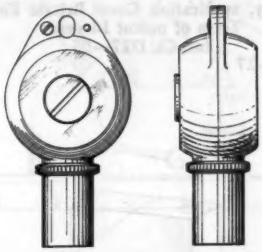


220,051
WRISTWATCH
Cyril C. Gsell, Port Chester, N.Y., assignor to R. Gsell & Company, Inc., New York, N.Y.
Filed Aug. 6, 1969, Ser. No. 18,563
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D42—8

220,052
CANDLESTICK
Harold D. Stoner, 355 Adams St., Oakland, Calif. 94610
Filed Jan. 29, 1970, Ser. No. 21,129
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—2



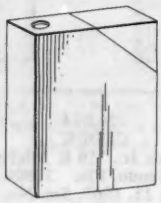
220,053
PULLEY FOR VERTICALLY ADJUSTABLE HANGING LAMP
Luigi Caramella, Varallo, Vercelli, Italy
Filed June 9, 1969, Ser. No. 17,571
Claims priority, application Italy Dec. 12, 1968
Term of patent 14 years
Int. Cl. D26—*02;* D8—*03*
U.S. Cl. D48—4

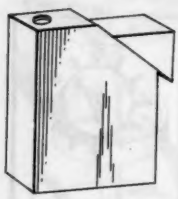


220,054
CLOCK
Guy A. Morse, Jr., 710 E. Michigan Ave., Orlando, Fla. 32806
Filed Aug. 11, 1969, Ser. No. 18,622
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D42—7

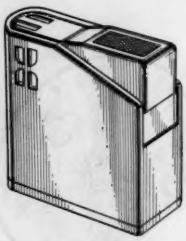
220,055
COMBINED SUSPENDED MIRROR AND LIGHT THEREFOR
De Anna L. Holton, 3806 Sycamore Drive, Boise, Idaho 83703
Filed Jan. 14, 1970, Ser. No. 20,923
Term of patent 14 years
Int. Cl. D26—*02;* D28—*03*
U.S. Cl. D48—20

220,056
CIGARETTE LIGHTER
William Retzler, Wickham, England, assignor to Tetra Molectric Limited
Continuation-in-part of design application Ser. No. 12,972, July 26, 1968. This application Aug. 4, 1969, Ser. No. 18,765
Claims priority, application Great Britain Feb. 16, 1968
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D48—27

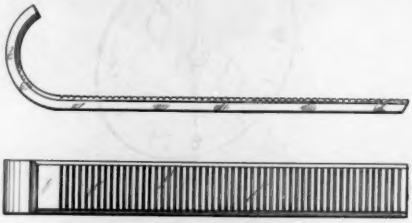




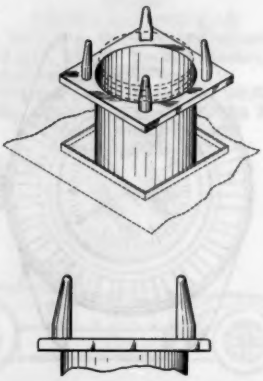
220,057
CIGARETTE LIGHTER OR SIMILAR ARTICLE
Sadao Yoshinaga, Tokyo, Japan, assignor to Yoshinaga Prince Co., Ltd., Tokyo, Japan
Filed Nov. 18, 1969, Ser. No. 20,165
Claims priority, application Japan May 22, 1969
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D48—27



220,058
AUTOMOBILE FENDER LIGHT MARKER
A. Robert Bernstein, 14 Eastwood Lane, Easton, Conn. 06425
Filed July 18, 1969, Ser. No. 18,271
Term of patent 14 years
Int. Cl. D12—*99*
U.S. Cl. D48—32

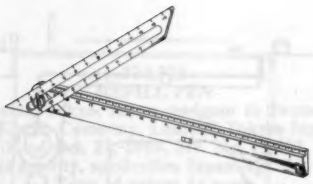


220,059
SELF-LEVELING DISPENSER
Henry H. Rothschild, Teaneck, N.J., assignor to Caddy Corporation of America, Secaucus, N.J.
Filed Mar. 13, 1969, Ser. No. 16,231
Term of patent 14 years
Int. Cl. D6—*99;* D12—*02*
U.S. Cl. D52—2

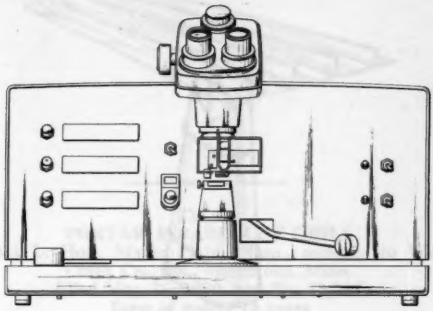


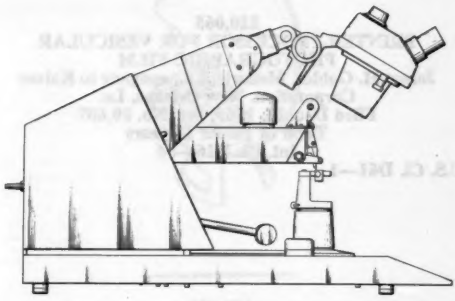
220,060
COMBINED COIN CONTAINER AND DISPENSER
George Luisa, South Country Road, Brookhaven, N.Y. 11719
Filed Nov. 3, 1969, Ser. No. 19,885
Term of patent 7 years
Int. Cl. D20—*99*
U.S. Cl. D52—4

220,061
COMBINED PROTRACTOR AND STRAIGHT RULE
Herb Kerns, P.O. Box 715, Florence, Oreg. 97439
Filed Feb. 2, 1970, Ser. No. 21,208
Term of patent 14 years
Int. Cl. D10—*08*
U.S. Cl. D52—6

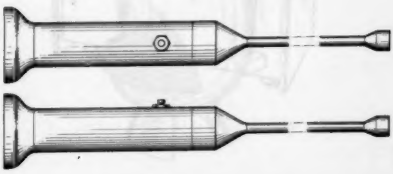


220,062
BONDER
William H. Hill and Robert C. Botting, Carlsbad, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.
Filed Oct. 3, 1969, Ser. No. 19,408
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D55—1



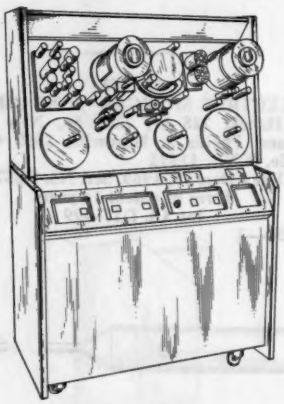


220,063
PHOTOELECTRIC MUSICAL TONE GENERATOR
Bruce C. Haack, 228 W. 72nd St., New York, N.Y. 10023, and Phyllis J. Horowitz, 3359 Ocean Ave., Oceanside, N.Y. 11572
Filed Dec. 19, 1969, Ser. No. 20,574
Term of patent 14 years
Int. Cl. D17—*99*
U.S. Cl. D56—1

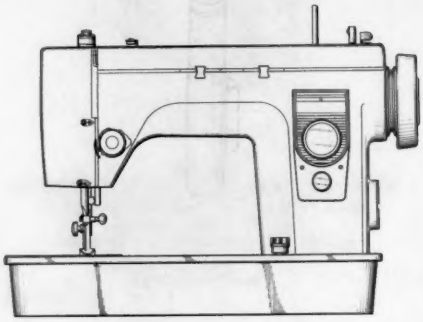


220,064
UNDERWATER VIEWING DEVICE
Richard E. Warren, 3089 Alki Ave. SW., Seattle, Wash. 98116
Filed July 15, 1969, Ser. No. 18,205
Term of patent 14 years
Int. Cl. D16—*08; D2—03*
U.S. Cl. D57—1

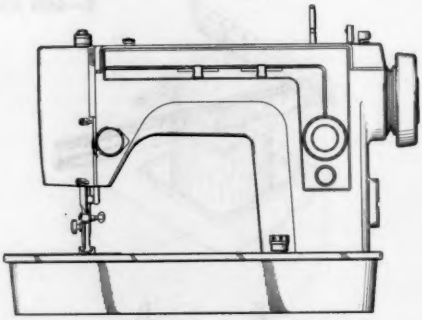
220,065
PRINTER-PROCESSOR FOR VESICULAR PHOTOGRAPHIC FILM
James H. Gabler, Metairie, La., assignor to Kalvar Corporation, New Orleans, La.
Filed Dec. 22, 1969, Ser. No. 20,607
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D61—1



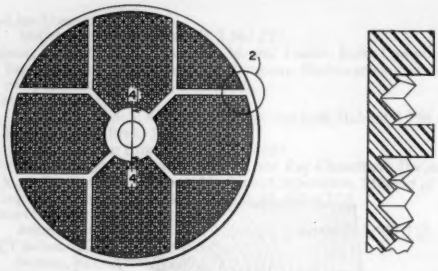
220,066
SEWING MACHINE
Yoshiaki Eguchi and Yasuaki Yamamoto, Tokyo, Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan
Filed Oct. 28, 1969, Ser. No. 19,766
Claims priority, application Japan May 28, 1969
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D70—1



220,067
SEWING MACHINE
Yoshiaki Eguchi, Tokyo, Japan, assignor to Janome Sewing Machine Co., Ltd., Tokyo, Japan
Filed Oct. 28, 1969, Ser. No. 19,772
Claims priority, application Japan May 28, 1969
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D70—1



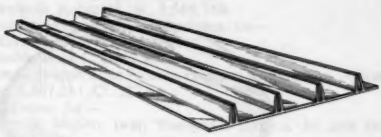
220,068
REFLECTOR
Sidney A. Heenan, Park Ridge, Ill., assignor to Amerace Esna Corporation, Union, N.J.
Filed Nov. 5, 1969, Ser. No. 20,076
Term of patent 14 years
Int. Cl. D29—*99*
U.S. Cl. D72—1



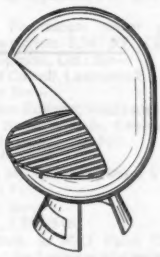
220,069
CLIP FOR A WRITING INSTRUMENT
Jean Michel Collaud, Moillesulaz, Geneva, Switzerland, assignor to Fabrique Suisse de Crayons Caran d'Ache S.A., Geneva, Switzerland
Filed May 20, 1969, Ser. No. 17,238
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D74—2

220,070
REFILL PEN
Kosei Iwasaki, Tokyo, Japan, assignor to Iwasaki Kinzoku Kogyo Company, Limited, Tokyo, Japan
Filed Oct. 22, 1969, Ser. No. 19,677
Claims priority, application Japan Apr. 24, 1969
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D74—17

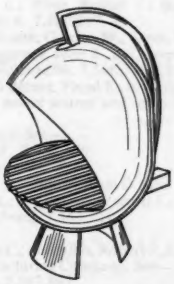
220,071
DISPLAY PANEL
John M. Le Vett, Jr., and Robert R. Barnes, Lakewood, Colo., assignors to Albar Products, Inc., Ogden, Utah
Filed Mar. 7, 1969, Ser. No. 16,107
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D80—9



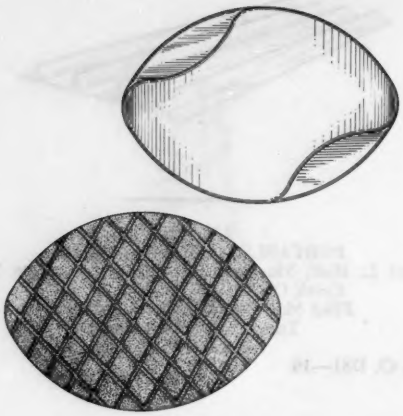
220,072
PORTABLE BARBECUE GRILL
James L. Hoff, Maple Plain, Minn., assignor to West Creek Co., Inc., Minnetoka, Minn.
Filed Mar. 26, 1970, Ser. No. 22,062
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D81—10



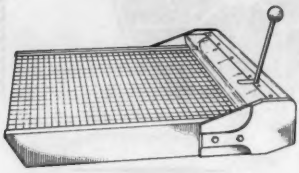
220,073
PORTABLE ELECTRIC BARBECUE GRILL
Merlin W. Ehrlichmann, Minnetonka, Minn., assignor to West Creek Co., Inc., Minnetonka, Minn.
Filed Mar. 26, 1970, Ser. No. 22,063
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D81—10



220,074
COMBINED CLOTHES AND LINT BRUSH
Nathan K. Morris, 600 8th Ave., Asbury Park, N.J. 08802
Filed Feb. 24, 1970, Ser. No. 21,587
Term of patent 14 years
Int. Cl. D28—*03;* D4—*02*
U.S. Cl. D86—13



220,075
PAPER TRIMMER
Robert B. Ford, 8834 E. Naomi Ave., San Gabriel, Calif. 91775
Filed Jan. 7, 1970, Ser. No. 20,790
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D95—3



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Allen, Millard, deceased0 (by Allen, Clara; executrix). Motorcycle carrier. 3,567,052, Cl. 214-450.

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Alth, Max. Eddy current brakes. 3,567,976, Cl. 310-93.

Altieri, Pietro; Giunchiglia, Ezio; and Trebbi, Roberto, to Pietro, Altieri, Giunchiglia, Ezio Trebbi, Roberto Conti, Giuseppe. Water closet apparatus. 3,566,416, Cl. 4-40.

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Altshuler, Saul; Arnush, Donald; Glatt, Leonard; and Peskoff, Arthur, to TRW Inc. Method of an apparatus for remotely determining the profile of fluid turbulence. 3,567,915, Cl. 235-151.3

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Dawihl, Walter: *See*—
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Doll, Henri-Georges, to Schlumberger Technology Corp. Methods and apparatus for logging spontaneous potentials in wells. Re. 27,079, 3–2–71, Cl. 324—1.

Fairchild Camera and Instrument Corp.: *See*—
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Fisnar, Igor, and R. H. Lester, Jr., to Fairchild Camera and Instrument Corp. Incremental drive mechanism. Re. 27,080, 3–2–71, Cl. 74—143.

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Graber, Joseph V., and F. F. Salzmann, to Consolidated Foods Corp. Support for draperies and the like. Re. 27,086, 3–2–71, Cl. 160—345.

Klingler, Emil A., W. Dawihl, and E. Dorre, to Feldmuhle A.G. Sintered transparent bodies of aluminium oxide and method of preparing the same. Re. 27,083, 3–2–71, Cl. 106—65.

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Morrow, Howard B., Jr.: *See*—
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Shaw, Benjamin C., and H. B. Morrow, Jr., to Cooke Engineering Co. Radiation survey training apparatus. Re. 27,078, 3–2–71, Cl. 35—1.

Shockley, Gilbert R., H. H. Macklin, Jr., E. F. Barkman, and H. J. Coats, to Reynolds Metals Co. Formation of low friction glass-like surface on aluminum silicon alloy for engine operation. Re. 27,081, 3–2–71, Cl. 123—193.

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Ishida, Frank K., to Monrovia Nursery Co. Azalea plant. 3,031, 3–2–71, Cl. 57.

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44— 68	3,567,410	
46— 17	3,566,529	
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163	RE.27,084	
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59— 78.1	3,566,603	
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64— 14	3,566,617	
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81—384	3,566,721	
82— 12	3,566,722	
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83— 1	3,566,724	
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92— 48	3,566,750	
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108—153	3,566,808	
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Classification of Designs

D 8–273	220,027	D13– 1	220,036	D26– 14	220,044	D42– 8	220,051	D52– 4	220,060	D72– 1	220,068
D 9–113	220,028	D14– 3	220,037	D29– 23	220,045	D48– 2	220,052	6	220,061	D74– 2	220,069
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Classification of Plants

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